

# MANUFACTURES : PORTO RICO

## STATISTICS OF MANUFACTURES FOR THE TERRITORY, CITIES, AND INDUSTRIES

Prepared under the supervision of W. M. STEUART, Chief Statistician for Manufactures

### INTRODUCTION.

ance bulletin gives the statistics of manu-  
the territory of Porto Rico for the calendar  
shown by the Thirteenth Census. It will  
without change as a part of the Com-  
the Census for Porto Rico, and in the  
of the Thirteenth Census.

summarizes the general results of the  
try, presenting a series of special tables in  
ain facts printed in the general tables are  
venient form for the territory as a whole,  
ortant industries. It also presents tables  
statistics for the industries of the territory  
and for a few important industries are  
y character of ownership, size of establish-  
iber of wage earners, and prevailing hours  
formation which could not be presented in  
les for each industry without disclosing the  
dividual establishments.

ad of the bulletin are two general tables.  
gives the number of establishments and  
engaged in the industries, primary power,  
aries and wages, cost of materials, value  
s, and value added by manufacture for all  
combined and for certain important indus-  
99.

gives separate statistics for all industries  
for the four cities that had in 1910 a popula-  
000 and over.

ensus: **Factory industries.**—Census statistics of manu-  
compiled primarily for the purpose of showing the  
relative magnitude of the different branches of indus-  
and their growth or decline. Incidentally, the effort is  
ent data throwing light upon character of organization,  
establishments, size of establishments, labor force, and  
acts. When use is made of the data for these purposes  
ive that due attention should be given to the limitations  
s. Particularly is this true when the attempt is made  
m them figures purporting to show average wages, cost  
n, or profits. These limitations will be fully discussed  
al report on manufactures for the United States as a  
is impossible to reproduce such discussion in the  
ative to the individual states.

is of 1909 for Porto Rico was not confined strictly to  
ing establishments conducted under the factory system,  
shed from the neighborhood, hand, and building indus-  
census does not include establishments which were  
the entire year or had a value of product of less than

\$500, or the manufacturing done in educational, eleemosynary,  
and penal institutions, or in governmental establishments, except  
those of the Federal Government.

**Period covered.**—The returns cover the calendar year 1909, or  
the business year which corresponds most nearly to that calendar  
year. The statistics cover a year's operations, except for estab-  
lishments which began or discontinued business during the year.

**The establishment.**—The term "establishment" comprises the  
factories, mills, or plants which are under a common ownership or  
control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment as thus  
defined were not all located within the same city or state, separate  
reports were secured in order that the separate totals might be in-  
cluded in the statistics for each city or state. In some instances  
separate reports were secured for different industries carried on in  
the same establishment.

**Classification by industries.**—The establishments were assigned  
to the several classes of industries according to their products of  
chief value. The products reported for a given industry may thus,  
on the one hand, include minor products very different from those  
covered by the class designation, and, on the other hand, may not  
include the total product covered by this designation, because some  
part of this product may be made in establishments in which it is  
not the product of chief value.

**Selected industries.**—The general tables at the end of this bul-  
letin give the principal facts separately for the industries of the  
territory. A selection has been made of the leading industries of  
the territory for more detailed consideration. Sometimes an indus-  
try of greater importance than some of those selected is omitted  
because it comprises so few establishments that these detailed  
presentations would reveal the operations of individual concerns.

**Persons engaged in industry.**—The following general classes of  
persons engaged in manufacturing industries have been distin-  
guished: (1) Proprietors and officials, (2) clerks, and (3) wage  
earners. The first group includes proprietors and firm members,  
salaried officers of corporations, and superintendents and managers.

The number of persons engaged in the industries, segregated by  
sex, and, in the case of wage earners, also by age (whether under 16  
or 16 and over), was reported for December 15, or the nearest repre-  
sentative day. The 15th of December was selected as representing  
for most industries normal conditions of employment, but where  
conditions were exceptional, and particularly in the case of certain  
seasonal industries, such as sugar and molasses, the December date  
could not be accepted as typical and an earlier date had to be chosen.

In the case of employees other than wage earners the number  
thus reported on December 15 or other representative day has been  
treated as equivalent to the average for the year, since the number  
of employees of this class does not vary much from month to month  
in a given industry. In the case of wage earners the average is  
obtained in the manner explained in the next paragraph.

**Wage earners.**—In addition to the report by sex and age of the  
number of wage earners on December 15 or other representative  
day, a report was obtained of the number employed on the 15th of

each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The distribution of this average number by sex and age has been estimated or computed for each industry on the basis of the proportions shown in the age and sex distribution reported for the wage earners employed in that industry on December 15 or the nearest representative day. It is believed that the distribution thus obtained can be accepted as typical and as sufficiently accurate for statistical purposes.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because in view of the variations of date such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

**Prevailing hours of labor.**—The census made no attempt to ascertain the number of employees working a given number of hours per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and no attention is given to the fact that a limited number of employees may have hours differing from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

**Capital.**—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

**Materials.**—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term "Materials" includes fuel, rent of power and heat, mill supplies, and containers, as well as materials forming a

constituent part of the product. Fuel includes all fuel used, whether for heat, light, or power, or for the process of manufacture.

**Expenses.**—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness, dividends on stock, and allowances for depreciation.

**Value of products.**—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

**Value added by manufacture.**—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishment. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "value added by manufacture."

**Cost of manufacture and profits.**—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products, the rate of profit on the investment could not properly be calculated, because of the very defective character of the returns regarding capital.

**Primary power.**—The figures given for this item show the total of the primary power used by the establishments. They do not cover the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

**Location of establishments.**—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the fact that often establishments are located just outside the boundaries of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

INDUSTRIES IN GENERAL.

**General character of the territory.**—Porto Rico is the smallest and most easterly of the four Greater Antilles (Cuba, Haiti, Jamaica, and Porto Rico), its area being 3,435 square miles. It was ceded formally to the United States by Spain under the treaty of Paris, December 11, 1898. On May 1, 1900, a civil government was established, and on July 25, 1901, a proclamation was issued by the President declaring that free trade existed between the United States and Porto Rico.

In 1765 the population was only 44,883; in 1860 it was 583,308; in 1899, 953,243; and in 1910, 1,118,012. This population is distributed evenly over the entire island, only 9.9 per cent living in cities of 10,000 inhabitants and over. San Juan, with a population of 48,716 in 1910, is the largest city. Three other cities have a population of more than 10,000: Ponce, with 35,005; Mayaguez, with 16,563; and Caguas, with 10,354. The density of population of the island is 325 per square mile, the corresponding figure for 1899 being 278.

Favorable climatic conditions, excellent drainage, and unusually productive soil have made the island well adapted for agriculture, upon which its manufactures are directly dependent. In the lowland plains, only a little above the level of the sea, the soil is alluvial and rich, and here the sugar cane, the island's most productive crop, is grown. On the slopes of the upland hills, from 600 to 2,400 feet above sea level, tobacco and coffee thrive, these crops ranking second and third in importance. Of the total area, about 95 per cent is returned as in farms, and of the total farm acreage 75.3 per cent is reported as improved.

**Importance and growth of manufactures.**—The manufacture of sugar and molasses, the making of cigars and cigarettes, and the cleaning and polishing of coffee are the most important manufacturing industries of Porto Rico.

The following table gives the more important figures relative to all classes of manufactures combined for the territory, as returned at the census of 1909:

	Number or amount, 1909.		Number or amount, 1909.
Number of establishments.....	939	Expenses.....	\$31,139,000
Persons engaged in manufactures...	18,122	Services.....	4,898,000
Proprietors and firm members..	1,478	Salaries.....	1,259,000
Salaried employees.....	1,062	Wages.....	3,639,000
Wage earners (average number)..	15,582	Materials.....	21,479,000
Primary horsepower.....	34,005	Miscellaneous.....	4,762,000
Capital.....	\$25,544,000	Value of products.....	36,750,000
		Value added by manufacture (value of products less cost of materials)..	15,271,000

In 1909 the territory of Porto Rico had 939 manufacturing establishments, which gave employment to an average of 18,122 persons during the year and paid out \$4,898,000 in salaries and wages. Of the persons employed, 15,582 were wage earners. These establishments turned out products to the value of \$36,750,000, to produce which materials costing \$21,479,000 were consumed. The value added by manufacture was thus \$15,271,000, which figure best represents the net wealth created by manufacturing operations during the year.

The present census of manufactures was the first taken in Porto Rico, and for that reason the statistics can not be compared with any earlier figures. A census of agriculture was taken in 1899, under the direction of the Secretary of War, and, considering the dependency of manufacturing upon agriculture in the case of Porto Rico, furnishes a general basis to indicate the progress of manufactures subsequent to the acquisition of the island by the United States.<sup>1</sup> The progress

of manufactures during the past 10 years is also indicated by the amount of exports, since but a comparatively small proportion of the manufactured products is consumed locally. This is especially true in respect to sugar and molasses, coffee, and cigars and cigarettes, which have together formed from 85 to 90 per cent of the total exports during the past few years.

The following tabular statement gives the total value of exports for the years ending June 30, 1901, to 1909:

FISCAL YEAR ENDING JUNE 30—	Exports.
1909.....	\$30,391,225
1908.....	30,644,400
1907.....	26,996,300
1906.....	23,257,530
1905.....	18,709,505
1904.....	16,265,003
1903.....	15,089,079
1902.....	12,433,956
1901.....	8,583,967

Of the total value of exports for the fiscal year ending June 30, 1909, \$18,924,491 represented the value of raw sugar and of molasses, \$3,715,744 that of coffee,

<sup>1</sup> See, also, Report of H. K. Carroll, special commissioner to Porto Rico; Report of the Military Governor on Civil Affairs, 1900; Bulletin of the Bureau of Labor, No. 61, 1905; and the Report of the Bureau of Statistics on Commercial Porto Rico in 1906.

and \$4,413,891 that of cigars and cigarettes; these three classes of exports together contributing 89 per cent of the total.

The relative importance of the leading manufacturing industries of the territory are shown in the following table:

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.	
		Average number.	Per cent distribution.	Amount.	Per cent distribution.	Amount.	Per cent distribution.
All industries.....	939	15,582	100.0	\$36,750,000	100.0	\$15,271,000	100.0
Sugar and molasses.....	108	5,062	32.5	20,569,000	56.0	8,295,000	54.3
Tobacco manufactures.....	282	7,025	45.1	6,060,000	16.5	4,002,000	26.2
Coffee, cleaning and polishing.....	37	120	0.8	5,053,000	13.7	289,000	1.9
Bread and other bakery products.....	258	1,197	7.7	1,730,000	4.7	567,000	3.6
Liquors, distilled.....	14	58	0.4	1,117,000	3.0	974,000	6.4
Printing and publishing.....	43	353	2.3	371,000	1.0	235,000	1.5
Lumber and timber products.....	8	123	0.8	269,000	0.7	91,000	0.6
Boot and shoe shops.....	59	303	1.9	190,000	0.5	92,000	0.6
Cars and general shop construction and repairs by steam-railroad companies.....	6	342	2.2	186,000	0.5	125,000	0.8
Foundry and machine-shop products.....	6	188	1.2	178,000	0.5	120,000	0.8
Hats, straw.....	3	122	0.8	177,000	0.5	91,000	0.6
Leather, tanned, curried, and finished.....	4	46	0.3	176,000	0.5	85,000	0.6
All other industries.....	111	643	4.1	674,000	1.8	315,000	2.1

The most important industries listed in this table, where they are arranged in the order of the value of products, call for brief consideration.

*Sugar and molasses.*—This industry is by far the most important manufacturing industry in the island. The value of its products formed 56 per cent, and the value added by manufacture 54.3 per cent, of the respective totals for all industries.

*Tobacco manufactures.*—This industry was practically confined to the manufacture of cigars and cigarettes, and all but two of the establishments were engaged in the manufacture of cigars only. Of the 282 cigar and cigarette factories reported, 45 were engaged in manufacturing cigars or cigarettes either wholly or partially for export. The value of tobacco manufactures intended for local consumption approximated \$1,500,000, or about 25 per cent of the total value of all tobacco manufactures. From the standpoint of the number of employees this industry is of greater importance than the manufacture of sugar, reporting 45.1 per cent of all wage earners, as compared with 32.5 per cent for the latter industry.

*Coffee, cleaning and polishing.*—While this is one of the characteristic industries of the territory and its value of products was relatively large, forming 13.7 per cent of the total for all manufacturing industries, it gave employment to an average of only 120 wage earners.

*Bread and other bakery products.*—The large number of establishments engaged in this industry is due to the fact that domestic bread making is not carried on extensively, and practically all the bread consumed on the island is made by persons who make a specialty of this line of work, which is conducted in small shops. This industry gave employment to an average of 1,197 wage earners, and the value of the products amounted to \$1,730,000.

*Liquors, distilled.*—This industry depends directly on the sugar and molasses industry for its raw material. Its products are principally alcohol and rum.

Measured by value added by manufacture, these industries held generally the same relative rank as when measured by value of products, though "Liquors, distilled" becomes third in order instead of "Coffee, cleaning and polishing," which, in turn, becomes fifth. The five industries represent 92.4 per cent of the total value added by manufacture.

Among the industries not listed separately in the table the canning and preserving of pineapples, the manufacture of chocolate and cocoa products, and the manufacture of bay rum and alcoholado may be mentioned as peculiar to the tropical climate of Porto Rico.

*Persons engaged in manufacturing industries.*—The following table shows the distribution of the average number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age in the manner already explained in the "Introduction."

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes.....	18,122	16,300	1,822
Proprietors and officials.....	1,786	1,635	151
Proprietors and firm members.....	1,478	1,331	147
Salaried officers of corporations.....	44	44	—
Superintendents and managers.....	264	260	4
Clerks.....	754	737	17
Wage earners (average number).....	15,582	13,028	1,654
16 years of age and over.....	14,824	13,268	1,556
Under 16 years of age.....	758	660	98

This table shows that there were 18,122 persons returned as the average number engaged in manufactures during 1909, of whom 15,582 were wage earners, 1,786 officials, and 754 clerks. The large proportion of proprietors and firm members was due to the unusual number of general and limited partnerships, the former being composed for the most part of the so-called family partnerships, and the latter

being in some respects similar to the corporate form of ownership. Corresponding figures for individual industries will be found in Table I.

In considering this table it should be noted that several of the industries are peculiarly seasonal, so that the number employed during certain months is far greater than the average number for the entire year. The variation in the number employed is very pronounced in the sugar and molasses industry, which for several months gave employment to only about 2,200 wage earners, while during the busy season over 8,400 were employed.

The following table shows the percentage of proprietors and officials, clerks, and wage earners, respectively, in the total number of persons employed in manufactures. It covers all industries combined and five important industries.

INDUSTRY.	PER CENT OF PERSONS ENGAGED IN MANUFACTURES.			
	Total.	Proprietors and officials.	Clerks.	Wage earners (average number).
All industries.....	100.0	9.9	4.2	86.0
Bread and other bakery products.....	100.0	25.3	1.6	73.1
Coffee, cleaning and polishing.....	100.0	48.9	7.0	43.5
Liquors, distilled.....	100.0	48.9	8.1	43.0
Sugar and molasses.....	100.0	6.5	7.7	85.8
Tobacco manufactures.....	100.0	5.2	1.7	93.1
All other industries.....	100.0	15.0	4.5	80.5

Of the persons engaged in all manufacturing industries, 9.9 per cent were officials, 4.2 per cent clerks, and 86 per cent wage earners. In the cleaning and polishing of coffee and in the manufacture of distilled liquors a large number of establishments are conducted by individuals and general and limited partnerships, and the work is to a great extent done by the proprietors and partners. Therefore the proportion of persons engaged in these industries falling in the class of proprietors and officials is very high, namely, 48.9 per cent in each case. A much smaller proportion is shown for this class in the two industries "Sugar and molasses" and "Tobacco manufactures."

The following table shows in percentages, for all industries combined and for some of the important industries separately, the distribution of clerks by sex and of wage earners by age periods and sex:

INDUSTRY.	CLERKS.		WAGE EARNERS (AVERAGE NUMBER).			
	Per cent.		Per cent 16 years of age and over.		Per cent under 16 years of age.	
	Male.	Female.	Male.	Female.	Male.	Female.
All industries.....	97.7	2.3	85.1	10.0	4.2	0.6
Bread and other bakery products.....	100.0	0.0	98.3	.....	1.7	.....
Coffee, cleaning and polishing.....	100.0	0.0	75.0	25.0	.....	.....
Liquors, distilled.....	100.0	0.0	94.8	.....	5.2	.....
Sugar and molasses.....	98.2	1.8	91.1	1.4	7.4	(1)
Tobacco manufactures.....	90.0	4.0	78.9	17.0	2.0	1.2
All other industries.....	96.6	3.4	84.5	9.2	5.7	0.6

<sup>1</sup> Less than one-tenth of 1 per cent.

Of the clerks, 97.7 per cent were male and 2.3 per cent female. Of the wage earners, 89.3 per cent were male and 10.6 per cent female; 95.1 per cent were 16 years or over and but 4.8 per cent were under 16 years.

It may be noted that the largest number of women are employed in the manufacture of tobacco, while the sugar and molasses industry gives employment to the largest number of children. Of the 1,654 female wage earners in all industries combined, 1,342, or 81.1 per cent, were employed in the manufacture of tobacco; and of the 758 wage earners in all industries under 16 years of age, 601, or 79.3 per cent, were in the two industries last named. With the tobacco industry omitted the females over 16 in all other industries combined would be 3.5 per cent of the total number of wage earners, and with the two industries "Tobacco manufactures" and "Sugar and molasses" omitted, persons of both sexes under 16 years of age, 4.5 per cent.

Wage earners employed by months.—The following table gives the number of wage earners employed on the 15th of each month during the year 1909 for all industries combined, for sugar and molasses, and for all other industries; it also gives the percentage which the number each month is of the greatest number employed in any one month:

MONTH.	NUMBER OF WAGE EARNERS.					
	All industries.		Sugar and molasses.		All other industries.	
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January.....	17,461	96.2	7,365	87.6	10,096	86.6
February.....	18,151	100.0	8,323	99.0	9,828	84.3
March.....	17,812	98.1	8,403	100.0	9,409	80.7
April.....	17,780	98.0	8,101	97.1	9,679	82.5
May.....	17,416	96.0	7,332	87.3	10,084	86.5
June.....	15,101	83.2	4,515	53.7	10,586	90.8
July.....	13,683	75.4	2,878	34.2	10,805	92.0
August.....	13,000	71.7	2,301	27.4	10,708	91.8
September.....	13,079	72.1	2,231	26.6	10,848	93.0
October.....	13,457	74.1	2,238	26.6	11,219	96.2
November.....	13,093	75.4	2,320	27.6	11,373	97.5
December.....	16,335	90.0	4,671	55.6	11,664	100.0

The single industry of "Sugar and molasses," which is a seasonal industry, giving employment to a large number of persons from January to May, inclusive, and to comparatively few from June to December, affects greatly the total for all industries combined. It thus not only makes the month of February the month of greatest employment, but also magnifies the irregularity of employment throughout the year. Outside the sugar and molasses industry the number of wage earners employed apparently underwent but little change, the numbers showing a gradual and almost uninterrupted increase from March to December and a falling off from December to March.

Prevailing hours of labor.—Establishments have been classified also according to the prevailing number of hours of labor of the bulk of their employees; that is to say, the wage earners of each establishment are all classified according to the prevailing hours of labor in the establishment, even though some may have to work a

## STATISTICS OF MANUFACTURES—PORTO RICO.

different number of hours. The table that follows shows the result of this classification. It is based on the average number of wage earners employed during

the year. In the case of "Sugar and molasses" this average is far less than the number employed in the busy season.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries .....	15,582	7,007	197	1,938	336	1,290	1,695	2,303	816
Boot and shoe shops.....	303	125	4	51		97	19	7	
Bread and other bakery products.....	1,197	253	84	9	274		229	28	315
Cars and general shop construction and repairs by steam-railroad companies.....	342	10				296	27		19
Coffee, cleaning and polishing.....	120	12		19	7	34	14	32	2
Food preparations.....	122	91				31			
Foundry and machine-shop products.....	188			160		19			
Hats, straw.....	122	58		64					
Leather, tanned, curried, and finished.....	46	10		20			14		
Liquors, distilled.....	58	14		3		17	2		22
Lumber and timber products.....	123	77	14	14		18			
Printing and publishing.....	353	287	11	37	13		5		
Sugar and molasses.....	5,062	213	9	198	27	604	1,367	2,218	420
Tobacco manufactures.....	7,025	5,630	58	1,221	15	82	12	7	
All other industries.....	521	232	17	133		90	6	11	32

It is evident from these figures that for nearly one-half of the wage earners employed in the manufacturing industries of Porto Rico the prevailing hours of labor are 48 or under per week, or not over 8 hours per day. Of those working the number of hours named, by far the greater number were employed in the tobacco industry. The next largest group of wage earners was that made up of those employed 72 hours per week, or 12 hours per day. Most of those falling in this group were employed in the sugar and molasses industry.

The tobacco factories, which furnish steady employment throughout the year to a larger number of wage earners than any other manufacturing industry, operated generally 48 hours or less per week. Only 116

wage earners, or 1.7 per cent of the total for the industry, were employed in establishments which were operated more than 54 hours per week, while 5,630 wage earners, or 80.1 per cent of the total, were employed in establishments which were operated 48 hours or less. On the other hand, in the sugar mills, 4,615 wage earners, or 91.2 per cent of the total for the industry, worked 60 hours or more per week, while only 447, or 8.8 per cent of the total, worked less than 60 hours. Indeed, in the sugar industry 2,644 wage earners, or 52.2 per cent of the total, worked 72 hours or more per week.

**Location of establishments.**—The next table shows to what extent manufacturing is centralized in cities having a population of 10,000 and over.

ITEM.	Year.	Aggregate.	CITIES HAVING A POPULATION OF 10,000 AND OVER.						DISTRICTS OUTSIDE OF CITIES HAVING A POPULATION OF 10,000 AND OVER.	
			Total.		10,000 to 25,000.		25,000 and over.		Number or amount.	Per cent of total.
			Number or amount.	Per cent of total.	Number or amount.	Per cent of total.	Number or amount.	Per cent of total.		
Population.....	1910	1,118,012	110,638	9.9	26,917	2.4	83,721	7.5	1,007,374	90.1
Number of establishments.....	1909	939	178	19.0	71	7.6	107	11.4	761	81.0
Average number of wage earners.....	1909	15,582	4,272	27.4	551	3.5	3,721	23.9	11,310	72.0
Value of products.....	1909	\$36,749,742	\$8,022,273	21.8	\$2,379,558	6.5	\$5,642,715	15.4	\$28,727,469	78.2
Value added by manufacture.....	1909	\$15,270,450	\$3,418,470	22.4	\$582,487	3.8	\$2,835,992	18.6	\$11,851,971	77.6

The population of Porto Rico is overwhelmingly rural, only 9.9 per cent living in cities of 10,000 inhabitants and over. Likewise the factories of the island are located largely in rural districts and small towns and are not concentrated to any extent in the cities.

The group of cities having a population of 10,000 to 25,000 includes Mayaguez and Caguas, and the group having a population of 25,000 and over includes San Juan and Ponce. A comparison of the figures for the two groups shows a larger percentage of the population employed in manufacturing and a greater per capita value added by manufacture in the second

group than in the first, but a larger per capita value of product in the first group than in the second. This seeming anomaly is due to the fact that the principal industry in the first group, and particularly in Mayaguez, was the cleaning and polishing of coffee, in which industry the work done on the raw material and the consequent increase in value through manufacture is small, as compared with the value of the commodity. In San Juan and Ponce, on the other hand, the manufacture of tobacco is the chief industry, and in this industry the work done upon the raw material and the consequent increase in value through manufacture is much greater.

While Mayaguez has only about half the population of Ponce, a far larger number of establishments were located in the former, and the total value of its products was nearly equal to that of Ponce.

The coffee cleaning and polishing industry contributed 68.3 per cent of the total value of manufactures reported for Mayaguez, and 64.8 per cent of that reported for Mayaguez and Caguas combined. This industry requires the services of only a few men in comparison with the number required in the tobacco factories of San Juan and Ponce.

**Character of ownership.**—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership or legal organization of manufacturing enterprises in 1909.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>All industries.....</b>	<b>939</b>	<b>15,582</b>	<b>\$36,749,742</b>	<b>\$15,270,450</b>
Individual.....	672	3,652	4,781,300	1,945,685
Firm.....	195	3,263	12,886,383	4,102,510
Corporation.....	63	8,668	18,977,267	9,131,971
Other.....	0	50	104,792	30,278
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	71.6	23.4	13.0	12.7
Firm.....	20.8	20.9	35.1	27.3
Corporation.....	6.7	55.2	51.6	59.8
Other.....	1.0	0.4	0.3	0.2
<b>Bread and other bakery products.....</b>	<b>258</b>	<b>1,197</b>	<b>\$1,729,886</b>	<b>\$556,450</b>
Individual.....	217	973	1,390,367	443,275
Firm.....	36	179	278,446	99,374
Corporation.....	5	45	61,073	16,801
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	84.1	81.3	80.4	79.7
Firm.....	14.0	15.0	16.1	17.3
Corporation.....	1.9	3.8	3.5	3.0
<b>Coffee, cleaning and polishing.....</b>	<b>37</b>	<b>120</b>	<b>\$5,052,599</b>	<b>\$288,339</b>
Individual.....	7	13	582,585	54,903
Firm.....	30	107	4,470,014	233,376
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	18.9	10.8	11.5	19.1
Firm.....	81.1	89.2	88.5	80.0
<b>Liquors, distilled.....</b>	<b>14</b>	<b>58</b>	<b>\$1,117,084</b>	<b>\$973,645</b>
Individual.....	4	11	110,030	91,967
Firm.....	7	31	664,959	578,640
Corporation.....	3	16	342,095	303,032
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	28.6	19.0	9.8	9.4
Firm.....	50.0	53.4	59.5	60.4
Corporation.....	21.4	27.6	30.6	31.1
<b>Sugar and molasses.....</b>	<b>108</b>	<b>5,062</b>	<b>\$20,569,348</b>	<b>\$6,205,793</b>
Individual.....	51	546	1,328,800	405,163
Firm.....	34	1,449	6,111,086	2,434,606
Corporation.....	23	3,067	13,129,453	5,365,974
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	47.2	10.8	6.5	6.0
Firm.....	31.5	28.6	29.7	29.3
Corporation.....	21.3	60.6	63.8	64.7
<b>Tobacco manufactures.....</b>	<b>282</b>	<b>7,025</b>	<b>\$6,060,393</b>	<b>\$4,002,848</b>
Individual.....	240	1,386	728,339	501,080
Firm.....	28	875	537,013	404,468
Corporation.....	14	4,764	4,795,041	3,097,301
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	85.1	19.7	12.0	12.5
Firm.....	9.9	12.5	8.9	10.1
Corporation.....	5.0	67.8	79.1	77.4

<sup>1</sup> Includes the group "Other" to avoid disclosure of individual operations.

In 1909 only 63 incorporated companies were engaged in manufactures, and, with the exception of the 37 engaged in the sugar and the tobacco industries, they were not large. While only 6.7 per cent of all establishments were under this form of ownership, they were credited with 51.6 per cent of the total value of

products and 59.8 per cent of the total value added by manufacture. In the sugar and molasses and tobacco industries the establishments under corporate ownership, though greatly in the minority, were credited with 63.8 per cent and 79.1 per cent, respectively, of the total value of products of the respective industries. This disproportionately large value added by manufacture shown for establishments under corporate ownership for all industries combined is to a great extent due to the tobacco industry.

The firm or partnership occupies in Porto Rico an unusually conspicuous place as a form of ownership. In 1909, 36 limited partnerships were reported manufacturing products valued at \$4,938,272, and 159 general partnerships manufacturing products valued at \$7,948,111. The largest number of establishments, 672, is shown for the individual form of ownership, but their value of products amounted to only \$4,781,300, or 13 per cent of the total. Three cooperative associations engaged in the manufacture of bread and other bakery products, four religious orders and societies, one trade union, and the Territorial Government Bureau of Printing and Supplies comprised the "Other" forms of ownership.

**Size of establishments.**—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it, the following table groups the establishments according to the value of their products. The table also shows the average size of establishments for all industries combined, and for important industries separately, as measured by number of wage earners, value of products, and value added by manufacture.

INDUSTRY AND VALUE OF PRODUCT.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>All industries.....</b>	<b>939</b>	<b>15,582</b>	<b>\$36,749,742</b>	<b>\$15,270,450</b>
Less than \$5,000.....	574	1,824	1,104,697	577,073
\$5,000 and less than \$20,000.....	216	1,925	2,065,216	887,803
\$20,000 and less than \$100,000.....	77	2,743	3,839,985	1,724,835
\$100,000 and less than \$1,000,000.....	66	4,790	20,160,343	7,279,773
\$1,000,000 and over.....	0	4,300	9,579,501	4,800,000
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	61.1	11.7	3.0	3.8
\$5,000 and less than \$20,000.....	23.0	12.4	5.6	5.8
\$20,000 and less than \$100,000.....	8.2	17.6	10.4	11.3
\$100,000 and less than \$1,000,000.....	7.0	30.7	54.0	47.7
\$1,000,000 and over.....	0.0	27.0	26.1	31.4
Average per establishment.....	.....	17	\$30,137	\$16,262
<b>Bread and other bakery products.....</b>	<b>258</b>	<b>1,197</b>	<b>\$1,729,886</b>	<b>\$556,450</b>
Less than \$5,000.....	131	340	359,174	111,184
\$5,000 and less than \$20,000.....	117	701	1,087,359	340,493
\$20,000 and less than \$100,000.....	10	156	292,353	98,773
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	50.8	28.4	20.2	20.0
\$5,000 and less than \$20,000.....	45.3	58.6	62.0	62.3
\$20,000 and less than \$100,000.....	3.9	13.0	16.9	17.8
Average per establishment.....	.....	5	\$6,705	\$2,157
<b>Coffee, cleaning and polishing.....</b>	<b>37</b>	<b>120</b>	<b>\$5,052,599</b>	<b>\$288,339</b>
\$5,000 and less than \$20,000.....	7	13	\$9,903	9,922
\$20,000 and less than \$100,000.....	13	44	767,539	55,723
\$100,000 and less than \$1,000,000.....	17	63	4,195,097	222,684
Per cent of total.....	100.0	100.0	100.0	100.0
\$5,000 and less than \$20,000.....	18.9	10.8	1.8	3.4
\$20,000 and less than \$100,000.....	35.1	36.7	15.2	19.3
\$100,000 and less than \$1,000,000.....	45.9	52.5	83.0	77.2
Average per establishment.....	.....	3	\$136,557	\$7,793

<sup>1</sup> Includes the group "Less than \$5,000."

STATISTICS OF MANUFACTURES—PORTO RICO.

INDUSTRY AND VALUE OF PRODUCT— <i>continued.</i>	Number of estab- lish- ments.	Average number of wage earners.	Value of products.	Value added by manufac- ture.
<b>Liquors, distilled.....</b>	<b>14</b>	<b>58</b>	<b>\$1,117,084</b>	<b>\$973,645</b>
\$5,000 and less than \$20,000 <sup>1</sup> .....	5	7	38,803	35,201
\$20,000 and less than \$100,000.....	5	14	172,830	141,679
\$100,000 and less than \$1,000,000.....	4	37	905,451	793,765
Per cent of total.....	100.0	100.0	100.0	100.0
\$5,000 and less than \$20,000.....	35.7	12.1	3.5	3.6
\$20,000 and less than \$100,000.....	35.7	24.1	15.5	14.9
\$100,000 and less than \$1,000,000.....	28.6	63.8	81.1	81.5
Average per establishment.....	4	4	\$79,792	\$69,546
<b>Sugar and molasses.....</b>	<b>108</b>	<b>5,062</b>	<b>\$20,569,348</b>	<b>\$8,295,793</b>
Less than \$5,000.....	48	201	78,344	37,353
\$5,000 and less than \$20,000.....	12	120	115,558	44,946
\$20,000 and less than \$100,000.....	8	223	440,007	158,678
\$100,000 and less than \$1,000,000.....	37	3,122	13,651,857	5,396,587
\$1,000,000 and over.....	3	1,396	6,283,582	2,658,229
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	44.4	4.0	0.4	0.5
\$5,000 and less than \$20,000.....	11.1	2.4	0.6	0.5
\$20,000 and less than \$100,000.....	7.4	4.4	2.1	1.9
\$100,000 and less than \$1,000,000.....	34.3	61.7	66.4	65.1
\$1,000,000 and over.....	2.8	27.6	30.5	32.0
Average per establishment.....	47	47	\$190,457	\$76,813
<b>Tobacco manufactures.....</b>	<b>282</b>	<b>7,025</b>	<b>\$6,060,393</b>	<b>\$4,002,848</b>
Less than \$5,000.....	231	850	370,544	251,526
\$5,000 and less than \$20,000.....	27	500	245,669	166,300
\$20,000 and less than \$100,000.....	14	1,312	855,957	616,045
\$100,000 and less than \$1,000,000.....	7	1,459	1,202,304	825,240
\$1,000,000 and over.....	3	2,904	3,295,919	2,142,737
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	81.9	12.1	6.1	6.3
\$5,000 and less than \$20,000.....	9.6	7.1	4.1	4.2
\$20,000 and less than \$100,000.....	5.0	18.7	14.1	15.4
\$100,000 and less than \$1,000,000.....	2.5	20.8	21.3	20.6
\$1,000,000 and over.....	1.1	41.3	51.4	53.5
Average per establishment.....	25	25	\$21,491	\$14,194

<sup>1</sup> Includes the group "Less than \$5,000."

This table shows that in 1909, of the 939 establishments only 6, or 0.6 per cent, had a value of product exceeding \$1,000,000. These establishments, however, notwithstanding their small number, had a total average number of wage earners of 4,300, or 27.6 per cent of the total number in all establishments; and the importance of their operations, as measured by value of product, was 26.1 per cent of the total, and by value added by manufacture 31.4 per cent of the total.

On the other hand, small establishments—that is, those having a value of product of less than \$5,000—constituted a very considerable proportion (61.1 per cent) of the total number of establishments, but the value of their product amounted to only 3 per cent of the total. The great bulk of the manufacturing was carried on in establishments having a product valued at not less than \$100,000.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The next table shows such a classification for all industries combined and for five important industries, and gives not only the number of establishments falling in each group, but also the average number of wage earners employed.

INDUSTRY.	ESTABLISHMENTS EMPLOYING—									
	Total.	No wage earners.	Under 6 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All industries.....	939	17	623	196	42	29	26	3	1	2
Bread and other bakery products.....	258	1	194	62	1					
Coffee, cleaning and polishing.....	37		32	5						
Liquors, distilled.....	14		11	3						
Sugar and molasses.....	108		43	18	17	16	12	1	1	
Tobacco manufactures.....	282		106	55	9	6	12	2		2
All other industries.....	240	16	147	53	15	7	2			
PER CENT OF NUMBER OF ESTABLISHMENTS.										
All industries.....	100.0	1.8	66.3	20.9	4.5	3.1	2.8	0.3	0.1	0.2
Bread and other bakery products.....	100.0	0.4	75.2	24.0	0.4					
Coffee, cleaning and polishing.....	100.0		86.5	13.5						
Liquors, distilled.....	100.0		78.6	21.4						
Sugar and molasses.....	100.0		39.8	16.7	15.7	14.8	11.1	0.9	0.9	
Tobacco manufactures.....	100.0		69.5	19.5	3.2	2.1	4.3	0.7		0.7
All other industries.....	100.0	0.7	61.2	22.1	6.2	2.9	0.8			
AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	15,582		1,771	1,970	1,331	1,983	4,059	1,114	833	2,521
Bread and other bakery products.....	1,197		633	571	23					
Coffee, cleaning and polishing.....	120		78	42						
Liquors, distilled.....	58		25	33						
Sugar and molasses.....	5,062		114	222	583	1,137	1,796	377	833	
Tobacco manufactures.....	7,025		568	544	264	411	1,980	737		2,521
All other industries.....	2,120		383	558	461	435	283			
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	100.0		11.4	12.6	8.5	12.7	26.0	7.2	5.3	16.2
Bread and other bakery products.....	100.0		50.4	47.7	1.9					
Coffee, cleaning and polishing.....	100.0		65.0	35.0						
Liquors, distilled.....	100.0		43.1	56.9						
Sugar and molasses.....	100.0		2.3	4.4	11.5	22.5	35.5	7.4	16.5	
Tobacco manufactures.....	100.0		8.1	7.7	3.8	5.9	28.2	10.5		35.9
All other industries.....	100.0		18.1	26.3	21.7	20.5	13.3			

This table shows classes in considerable detail. Consolidating these classes to a certain extent it will be seen that 89 per cent of the establishments employed under 21 persons each. The most numerous single group consists of the 623 establishments employing under 6 wage earners; the next being the group employing from 6 to 20, with 196 establishments. There were 6 establishments that employed over 250 wage earners; 2 employed over 1,000.

Of the total number of wage earners, 28.7 per cent were in establishments employing over 250 wage earners. The single group having the largest number of employees was the group employing from 101 to 250 wage earners. This group employed 4,059 wage earners, or 26 per cent of the total. Two of the individual industries listed in this table, "Sugar and molasses" and "Tobacco manufactures and snuff," are industries in which comparatively large establishments do most of the business, as appears from the classification of the wage earners.

**Expenses.**—As stated in the "Introduction," the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses going to make up the total.

The following table shows in percentages the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table I.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries.....	4.0	11.7	69.0	15.3
Bread and other bakery products.....	0.7	22.7	72.8	3.8
Coffee, cleaning and polishing.....	0.3	0.7	98.7	0.4
Liquors, distilled.....	1.4	1.5	13.7	83.4
Sugar and molasses.....	5.7	7.4	73.9	13.0
Tobacco manufactures.....	3.0	28.4	39.5	29.2
All other industries.....	6.3	28.3	58.2	7.2

This table shows that, for all industries combined, 69 per cent of the total expenses was incurred for materials, 15.7 per cent for services, i. e., salaries and wages, and 15.3 per cent for other purposes. The unusually large amount reported for miscellaneous expenses is due in part to the internal-revenue taxes, Federal and insular, paid on tobacco and distilled liquors, and also to the large amount reported in the sugar and molasses industry under the general head of "Rent of offices and buildings, rent of machinery, royalties, use of patents, insurance, ordinary repairs of buildings and machinery, advertising, traveling, and other sundry expenses."

**Engines and power.**—The following table shows for all industries combined the number of engines or other motors, according to their character, employed in gen-

erating power (including electric motors operated by purchased current), and their total horsepower at the census of 1909. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

POWER.	Number of engines or motors.	Horsepower.	Per cent distribution of horsepower.
Primary power, total.....	662	34,005	100.0
Owned.....	577	33,504	98.7
Steam.....	400	32,400	95.6
Gas.....	53	842	2.5
Water wheels.....	17	183	0.5
Water motors.....	1	12	( <sup>1</sup> )
Other.....	7	28	0.1
Rented—Electric.....	85	441	1.3
Electric motors.....	115	1,385	100.0
Run by current generated by establishment.....	30	044	68.2
Run by rented power.....	85	441	31.8

<sup>1</sup> Less than one-tenth of 1 per cent.

This table indicates that practically all the power reported was generated by steam and gas engines. Thirty electric motors, with a total of 944 horsepower, were run by current generated in the establishments, while 85 motors, with a total of 441 horsepower, were run by rented power. Although the water power available is very great, and almost constant the year round, comparatively little was used in the manufacturing industries of Porto Rico in 1909.

Of the total horsepower for all industries, by far the greater part, 31,055 horsepower, or 91.3 per cent, was employed in one industry, namely, the sugar and molasses industry. The tobacco factories required little power, and the factories engaged in the cleaning and polishing of coffee, which used the second largest amount of power, reported an aggregate of only 1,085 primary horsepower. Of the 939 establishments engaged in manufacturing in 1909, only 221 reported mechanical power in any form.

**Fuel.**—Closely related to the question of kind of power employed is that of the fuel used in generating this power, or otherwise as material in the manufacturing processes. Porto Rico has no mineral fuel, and its wood supply is being depleted as manufactures increase. The following table shows the quantity of each kind of fuel used in 1909:

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gas-oil (barrels).	Other (tons).
All industries.....	946	41,988	368	43,513	1,036	520
Bread and other bakery products.....	5	.....	6	13,444	75	.....
Coffee, cleaning and polishing.....	128	1,293	234	2,846	33	.....
Liquors, distilled.....	200	2,712	.....	737	.....	.....
Sugar and molasses.....	.....	31,808	.....	19,656	365	275
Tobacco manufactures.....	.....	790	.....	.....	17	.....
All other industries.....	613	5,385	123	6,830	546	245

## SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

For certain industries the Census Bureau collects details regarding the quantity and value of materials and products which do not appear on the general schedule. Data for the quantity and value of products for three important industries in Porto Rico are here presented.

**Sugar and molasses.**—A total of 566,445,203 pounds of raw sugar and 17,874,097 gallons of molasses was reported as manufactured during 1909. The total value of the raw sugar was \$20,164,887, of the molasses \$397,008, and of all other products \$7,453, or an aggregate value of products of \$20,569,348. As already stated, this industry is the leading manufacturing industry of the island. The modern methods and machinery installed in recent years have increased the production of sugar, but the quantity of molasses produced has remained about stationary. In 1909 there were no refineries in Porto Rico, and all the sugar used and exported was the raw brown sugar. Cane sugar only was produced.

**Tobacco manufactures.**—The quantity of cigarettes and the value of cigars and cigarettes can not be published separately without disclosing the operations of individual establishments, but a total of 217,792,000 cigars was reported as manufactured during 1909. Of this number, 152,739,000, or about 70 per cent, were for export and the remainder for local consumption. On the other hand, only 2.3 per cent of the cigarettes manufactured were for export.

While the tobacco plant is indigenous to the island, its cultivation was, prior to 1870, confined to small plantings for domestic consumption. The tobacco exports ranked third in value up to 1905. In that year they were practically equal to those of coffee, and since 1907 have greatly exceeded them. As this industry and the sugar and molasses industry have prospered, the coffee industry has declined. The land used for coffee is well adapted to tobacco growing, and upon legislation permitting the importation of tobacco

TABLE I.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY—AVERAGE NUMBER.										WAGE EARNERS—NUMBER DEC. 15, 1909, OR NEAREST REPRESENTATIVE DAY.					Primary horse-power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners. <sup>1</sup>			Total.	10 and over.		Under 10.				
					Male.	Female.	Total.	10 and over.			Male.	Female.					
								Male.	Female.								
1 All industries .....	639	18,122	1,478	308	737	17	15,582	13,268	1,556	788	.....	.....	.....	.....	.....	34,005	
2 Bay rum and alcoholado .....	6	15	8	1	1	.....	6	6	.....	.....	12	12	.....	.....	.....	.....	
3 Boot and shoe shops .....	59	367	62	13	20	.....	303	293	7	3	336	325	8	3	.....	3	
4 Bread and other bakery products .....	258	1,637	401	13	20	.....	1,197	1,177	.....	20	1,350	1,327	.....	23	.....	45	
5 Brick and tile .....	25	100	34	.....	.....	.....	66	62	.....	4	85	80	.....	5	.....	.....	
6 Canning and preserving, pineapples .....	4	57	.....	2	2	.....	48	28	.....	19	301	178	120	3	.....	54	
7 Carriages and wagons and materials .....	11	66	11	.....	1	.....	54	44	.....	10	57	46	.....	11	.....	25	
8 Cars and general shop construction and repairs by steam-railroad companies .....	6	355	.....	7	6	.....	342	308	.....	34	329	296	.....	33	.....	125	
9 Chocolate and cocoa products .....	4	24	10	1	1	.....	12	11	1	.....	16	14	2	.....	.....	36	
10 Coffee, cleaning and polishing .....	37	276	123	13	21	.....	120	90	30	.....	243	183	60	.....	.....	1,085	
11 Flour-mill and gristmill products .....	5	11	7	.....	.....	.....	4	4	.....	.....	6	6	.....	.....	.....	30	
12 Foundry and machine-shop products .....	6	217	16	1	12	.....	188	166	.....	22	216	191	.....	25	.....	230	
13 Hats, straw .....	3	139	7	1	8	1	122	68	.....	5	132	74	53	5	.....	15	
14 Ice, manufactured .....	6	60	6	8	8	.....	38	38	.....	.....	36	36	.....	.....	.....	237	
15 Leather goods .....	3	18	9	.....	.....	.....	9	9	.....	.....	11	11	.....	.....	.....	.....	
16 Leather, tanned, curried, and finished .....	4	62	10	4	2	.....	46	46	.....	.....	47	47	.....	.....	.....	107	
17 Lime .....	12	43	15	.....	.....	.....	28	28	.....	.....	68	68	.....	.....	.....	.....	
18 Liquors, distilled .....	14	135	61	5	11	.....	58	55	.....	3	64	61	.....	3	.....	91	
19 Lumber and timber products .....	8	171	26	6	16	.....	123	122	.....	1	134	133	.....	1	.....	392	
20 Printing and publishing .....	43	469	62	10	42	2	353	318	.....	12	369	332	13	24	.....	89	
21 Salt .....	3	60	2	2	2	.....	54	54	.....	.....	60	60	.....	.....	.....	28	
22 Shipbuilding, including boat building .....	3	9	4	.....	.....	.....	5	5	.....	.....	7	7	.....	.....	.....	.....	
23 Sugar and molasses .....	108	5,898	246	138	444	8	5,062	4,011	73	378	8,704	7,928	120	640	1	31,055	
24 Tobacco manufactures .....	282	7,543	306	87	120	5	7,025	5,544	1,258	223	8,002	6,315	1,433	158	96	150	
25 All other industries <sup>2</sup> .....	29	390	47	9	14	1	319	181	107	31	.....	.....	.....	.....	.....	199	

<sup>1</sup> Distribution by sex and age periods based on number reported December 15, or nearest representative date.

<sup>2</sup> All other industries embrace—

Boxes, cigar .....	2	Mattresses and spring beds .....	1
Brooms .....	1	Mineral and soda waters .....	9
Food preparations .....	8	Oil, essential .....	2
Hosiery and knit goods .....	1	Patent medicines and compounds and druggists' preparations .....	2
Matches .....	1	Pottery, terra-cotta, and fire-clay products .....	2

from Porto Rico into the United States practically free of duty, the growers planted these lands in tobacco. At the same time, the manufacturers of cigars and cigarettes began to pay more attention to the quality of the material used and to the skill of the labor employed.

**Coffee, cleaning and polishing.**—The coffee tree is not native to the island, but was introduced there in the first half of the eighteenth century. The first exports of coffee are reported to have occurred in 1765 and were of small value. By 1879, however, the raising of coffee had become an important industry, and from 1890 to 1898 it increased to such an extent that the value of the exports far exceeded those of sugar and molasses.

Practically all of the coffee raised goes through a complete or partial process of cleaning, hulling, polishing, and grading to prepare it for the market. The total quantity of rough coffee treated in 1909 was 65,225,378 pounds. The total quantity of cleaned and polished coffee obtained was 44,350,435 pounds. All but 5 of the 37 coffee mills reported the process of

polishing the coffee. The product of these 5 mills, which cleaned, hulled, and dried the berry without polishing it, amounted to only 1,153,695 pounds.

The modern wet process is superseding the older dry method, but requires a larger investment than the small planters can afford. The result is that the business of preparing the coffee for market is being transferred from the plantation to the large custom mills.

The following statement shows the number of coffee cleaning and polishing establishments engaged in merchant and in custom work, together with the value of products of the several classes of establishments in 1909:

Total number of mills.....	37
Merchant.....	26
Custom.....	7
Merchant and custom.....	4
Amount received for toll.....	\$35,270
Total value of products.....	\$5,052,599
Merchant milled.....	2,899,491
Custom milled.....	2,153,108

PORTO RICO, BY INDUSTRIES: 1909.

Capital.	EXPENSES.										Value of products.	Value added by manufacture.	
	Total.	Services.			Materials.		Miscellaneous.						
		Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.			
1	\$25,644,385	\$31,139,472	\$564,746	\$694,286	\$3,639,196	\$470,323	\$21,008,004	\$843,095	\$2,098,197	\$21,326	\$1,799,334	\$36,749,742	\$15,270,450
2	6,784	11,709	339	.....	806	98	8,933	48	959	.....	526	16,138	7,107
3	37,827	101,257	72	150	54,521	229	97,534	0,764	821	.....	806	190,409	92,346
4	155,878	1,611,591	4,047	6,426	366,107	61,407	1,112,029	37,914	5,001	300	16,501	1,729,886	559,450
5	24,617	20,621	.....	.....	11,664	5,049	2,315	748	573	.....	272	30,642	23,278
6	18,975	33,859	1,093	237	4,831	755	26,175	636	120	.....	.....	38,003	11,073
7	26,296	32,584	.....	96	11,862	917	17,870	.....	416	.....	1,057	43,165	24,372
8	168,350	186,035	11,050	3,142	106,067	4,667	59,844	.....	240	.....	5,025	186,035	125,524
9	22,837	32,092	500	416	3,086	1,512	25,302	880	300	.....	96	39,969	13,155
10	264,029	4,826,928	5,130	8,184	32,225	21,706	4,742,464	5,344	3,984	.....	7,801	5,052,599	283,339
11	2,880	9,820	.....	.....	597	256	8,761	120	86	.....	.....	12,401	3,384
12	162,654	139,767	1,200	4,580	63,556	7,841	49,793	7,480	2,501	.....	2,806	178,210	120,576
13	158,405	131,200	1,760	5,188	29,637	2,200	83,544	1,200	1,107	.....	6,474	177,197	91,393
14	73,783	58,937	7,828	3,186	9,935	22,109	7,258	.....	1,237	.....	7,294	99,927	70,500
15	1,461	3,898	.....	.....	1,136	.....	2,468	236	58	.....	.....	4,435	1,997
16	99,918	117,055	4,866	1,200	16,682	3,386	87,312	.....	1,591	.....	1,818	176,619	84,921
17	7,733	11,319	.....	.....	2,842	4,600	3,122	62	305	.....	298	14,149	6,337
18	206,813	1,050,345	0,620	8,400	15,871	23,089	120,359	1,084	862,881	600	11,300	1,117,084	973,645
19	113,392	240,862	5,376	7,370	39,996	4,710	173,708	4,900	978	.....	3,824	208,719	90,301
20	232,137	311,606	11,500	26,422	97,720	4,070	139,692	13,890	2,558	11,110	13,935	379,559	234,807
21	19,150	15,603	1,200	1,880	9,532	.....	.....	1,800	1,110	.....	31	26,810	26,810
22	3,530	5,014	.....	.....	1,518	.....	3,442	.....	.....	.....	54	6,810	3,368
23	20,709,796	16,603,922	410,065	537,793	1,227,685	288,330	11,985,225	722,822	178,519	7,430	1,240,144	20,569,348	8,265,793
24	2,868,374	5,214,134	81,602	73,884	1,479,507	5,150	2,652,395	25,935	1,026,411	1,770	467,770	6,060,393	4,002,848
25	158,766	309,327	9,598	6,732	51,573	7,026	212,113	11,163	5,732	8	5,382	341,235	122,096

## STATISTICS OF MANUFACTURES—PORTO RICO.

TABLE II.—SUMMARY FOR MUNICIPALITIES HAVING A POPULATION OF 10,000 AND OVER: 1909.

CITY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
		Total.	Proprietors and firm members.	Salaried employes.	Wage earners (average number).							
Expressed in thousands.												
Total for municipalities.....	178	4,869	296	301	4,272	4,148	\$4,262	\$232	\$1,060	\$4,604	\$8,023	\$3,419
San Juan.....	70	3,046	100	100	2,750	748	2,644	136	673	1,200	3,243	2,034
Ponce.....	37	1,082	56	55	671	2,886	1,342	71	252	1,598	2,400	822
Mayaguez.....	56	645	118	48	479	484	253	24	119	1,750	2,250	506
Caguas.....	15	96	22	2	72	30	23	1	16	47	124	77

O

## MANUFACTURES : RHODE ISLAND

## STATISTICS OF MANUFACTURES FOR THE STATE, CITIES, AND INDUSTRIES

Prepared under the supervision of W. M. STEUART, Chief Statistician for Manufactures

## INTRODUCTION.

This advance bulletin gives the statistics of manufactures for the state of Rhode Island for the calendar year 1909 as shown by the Thirteenth Census. It will be reprinted without change as a part of the state Compendium of the Census for Rhode Island, and in the final reports of the Thirteenth Census.

The text summarizes the general results of the census inquiry, presenting a series of special tables in which the main facts printed in the general tables are given in convenient form for the state as a whole and for important industries. It also presents tables in which the statistics for the industries of the state as a whole and for a few important industries are classified by character of ownership, size of establishments, number of wage earners, and prevailing hours of labor, information which could not be presented in general tables for each industry without disclosing the facts for individual establishments.

At the end of the bulletin are two general tables.

Table I gives for 1909, 1904, and 1899 the number of establishments and of persons engaged in the industries, primary power, capital, salaries and wages, cost of materials, value of products, and value added by manufacture reported for all industries combined and for certain important industries (1) for the state as a whole and (2) for the cities of Providence and Pawtucket. It also gives the same items for all industries combined for every city and town having in 1910 a population of over 10,000 but less than 50,000.

Table II gives statistics in detail for 1909 for the state and for a larger number of industries.

**Scope of census: Factory industries.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of organization, location of establishments, size of establishments, labor force, and similar subjects. When use is made of the data for these purposes, it is imperative that due attention should be given to the limitations of the figures. Particularly is this true when the attempt is made to derive from them figures purporting to show average wages, cost of production, or profits. These limitations will be fully discussed in the general report on manufactures for the United States as a whole. It is impossible to reproduce such discussion in the bulletins relative to the individual states.

The census of 1909, like that of 1904, was confined to manufacturing establishments conducted under the factory system, as distinguished from the neighborhood, hand, and building industries. Where statistics for 1899 are given they have been reduced to a

comparable basis by eliminating the latter classes of industries. The census does not include establishments which were idle during the entire year, or had a value of products of less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions, or in governmental establishments, except those of the Federal Government.

**Period covered.**—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—The term "establishment" comprises the factories, mills, or plants which are under a common ownership or control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment as thus defined were not all located within the same city or state, separate reports were secured in order that the separate totals might be included in the statistics for each city or state. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products very different from those covered by the class designation, and, on the other hand, may not include the total product covered by this designation, because some part of this product may be made in establishments in which it is not the product of chief value.

**Selected industries.**—The general tables at the end of this bulletin give the principal facts separately for the industries of the state. A selection has been made of the leading industries of the state for more detailed consideration. Sometimes an industry of greater importance than some of those selected is omitted because it comprises so few establishments that these detailed presentations would reveal the operations of individual concerns.

**Comparisons with previous censuses.**—Owing to the changes in industrial conditions it is not always possible to classify establishments by industries in such a way as to permit accurate comparison with preceding censuses. Table I, giving comparable figures for 1909, 1904, and 1899, therefore, does not embrace all the industries shown for 1909 in Table II.

**Influence of increased prices.**—In considering changes in cost of materials, value of products, and value added by manufacture, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures can not be taken as an exact measure of increase in the volume of business.

**Persons engaged in industry.**—At the censuses of 1909, 1904, and 1899 the following general classes of persons engaged in manufacturing industries have been distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks, and (5) wage earners. In the censuses of 1904 and 1899 these five classes were shown according to the three main groups: (1) Proprietors and firm members, (2) salaried officials, clerks, etc., and (3) wage earners. The second group included the three classes of salaried officers of corporations, superintendents and

managers, and clerks. In the present census an entirely different grouping is employed: That into (1) proprietors and officials, (2) clerks, and (3) wage earners. The first group includes proprietors and firm members, salaried officers of corporations, and superintendents and managers.

At this census the number of persons engaged in the industries, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for December 15, or the nearest representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where conditions were exceptional, and particularly in the case of certain seasonal industries, such as canning, the December date could not be accepted as typical and an earlier date had to be chosen.

In the case of employees other than wage earners the number thus reported on December 15 or other representative day has been treated as equivalent to the average for the year, since the number of employees of this class does not vary much from month to month in a given industry. In the case of wage earners the average is obtained in the manner explained in the next paragraph.

**Wage earners.**—In addition to the report by sex and age of the number of wage earners on December 15 or other representative day, a report was obtained of the number employed on the 15th of each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because in view of the variations of date such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In particular, totals by sex and age for the wage earners reported for the representative day would be misleading because of the undue weight given to seasonal industries, in some of which, such as canning and preserving, the distribution of the wage earners by sex and age is materially different from that in most industries of more regular operation. In order to determine as nearly as possible the sex and age distribution of the average number of wage earners in the state as a whole, the following procedure has been adopted:

The percentage distribution by sex and age of the employees in each industry, for December 15 or the nearest representative day, has been calculated from the actual numbers reported for that date. This percentage has been applied to the average number of employees for the year in that industry, to determine the average number of men, women, and children employed. These calculated averages for the several industries have been added up to give the average distribution for the state as a whole.

In 1899 and 1904 the schedule called for the average number of wage earners of each sex 16 years and over, and the total number under 16 years of age, for each month, and these monthly statements were combined in an annual average. Comparatively few manufacturing concerns, however, keep their books in such way as to show readily the number of men, women, and children (under 16) employed each month. These monthly returns by sex and age were, in fact, largely estimates. It was believed that a more accurate and reliable sex and age distribution could be secured by taking as a basis of estimate the actual numbers employed on a single day.

**Prevailing hours of labor.**—The census made no attempt to ascertain the number of employees working a given number of hours per week. The inquiry called merely for the prevailing practice fol-

lowed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and no attention is given to the fact that a limited number of employees may have hours differing from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

**Capital.**—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

**Materials.**—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term materials includes fuel, rent of power and heat, mill supplies, and containers, as well as materials forming a constituent part of the product. Fuel includes all fuel used; whether for heat, light, or power, or for the process of manufacture.

**Expenses.**—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness, dividends on stock, and allowances for depreciation.

**Value of products.**—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

**Value added by manufacture.**—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishments. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "value added by manufacture."

**Cost of manufacture and profits.**—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products the rate of profit on the investment could not properly be calculated, because of the very defective character of the returns regarding capital.

**Primary power.**—The figures given for this item show the total of the primary power used by the establishments. They do not cover the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

**Location of establishments.**—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the

fact that often establishments are located just outside the boundaries of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

**Laundries.**—The census of 1909 was the first to include statistics of laundries. The reports are confined to establishments using mechanical power. The data are presented separately and are

not included in the general total for manufacturing industries, in order to avoid interference with comparisons with prior censuses.

**Custom grist and saw mills.**—In order to make the statistics for 1909 comparable with those for 1904 the data for these mills have been excluded from all the tables presenting general statistics, and are given in a separate table at the end of this report.

INDUSTRIES IN GENERAL.

**General character of the state.**—Rhode Island, with a gross area of 1,250 square miles, of which 197 represent water surface, is the smallest state in the Union. Its population in 1910 was 542,610, as compared with 428,556 in 1900 and 345,506 in 1890. It ranked thirty-eighth among the 49 states and territories as regards population in 1910 and thirty-fifth in 1900. Ninety-six and seven-tenths per cent of the entire population of the state resides in incorporated cities and towns having a population of 2,500 inhabitants or over, as against 95.1 per cent in 1900.

The state has 9 cities and towns having a population of over 10,000: Providence, with a population of 224,326; Pawtucket, with 51,622; Woonsocket, with 38,125; Newport, with 27,149; Warwick, with 26,629; Central Falls, with 22,754; Cranston, with 21,107; East Providence, with 15,808; and Cumberland, with 10,107. In density of population Rhode Island far outranks all other states in the Union, having 508.5 persons per square mile, the corresponding figure for 1900 being 400.7. The transportation facilities are excellent, Providence, the largest city, being one of the most important seaports in New England, which, together with the fact that the state is traversed by the main line of the most important railway system in

New England, gives it direct and adequate connection with the other parts of the country.

**Importance and growth of manufactures.**—Rhode Island is preeminently a manufacturing community, and the growth and concentration of population in the state have been closely related to the increase in the importance of its manufacturing industries. During 1849 an average of 20,967 wage earners, representing 14.2 per cent of the total population, were employed in manufactures, while in 1909 an average of 113,538 wage earners, or 20.9 per cent of the total population, were so engaged. During this period of 60 years the gross value of products per capita increased from \$150 in 1849 to \$517 in 1909. From 1849 to 1904, however, the proportion which the manufactures of the state represent of the total value of the products of manufacturing industries in the United States decreased somewhat. This proportion was 2.2 per cent in 1849 and 1.4 per cent in 1904; the proportion for 1909 is not yet available.

The following table gives the most important figures relative to all classes of manufactures combined for the state as returned at the censuses of 1909, 1904, and 1899, together with percentages of increase from census to census:

	NUMBER OR AMOUNT.			PER CENT OF INCREASE.	
	1909	1904	1899	1904-1909	1899-1904
Number of establishments.....	1,951	1,617	1,678 <sup>1</sup>	20.7	13.6
Persons engaged in manufactures.....	122,641	104,299	( <sup>2</sup> )	17.6	( <sup>2</sup> )
Proprietors and firm members.....	1,721	1,561	( <sup>2</sup> )	10.2	( <sup>2</sup> )
Salaried employees.....	7,382	5,420	4,022	36.2	34.8
Wage earners (average number).....	113,538	97,318	88,197	16.7	10.3
Primary horsepower.....	226,740	182,608	153,619	24.2	18.9
Capital.....	\$290,901,000	\$215,901,000	\$176,902,000	34.7	22.0
Expenses.....	242,264,000	177,649,000	140,347,000	36.4	26.6
Services.....	65,811,000	50,154,000	41,296,000	31.2	21.4
Salaries.....	10,577,000	7,041,000	5,301,000	50.2	32.8
Wages.....	55,234,000	43,113,000	35,995,000	28.1	19.8
Materials.....	158,192,000	112,872,000	87,952,000	40.2	28.3
Miscellaneous.....	18,261,000	14,623,000	11,099,000	24.9	31.8
Value of products.....	280,344,000	202,110,000	165,550,000	38.7	22.1
Value added by manufacture (value of products less cost of materials).....	122,152,000	89,238,000	77,598,000	36.9	15.0

<sup>1</sup> Decrease.

<sup>2</sup> Figures not available.

In 1909 the state of Rhode Island had 1,951 manufacturing establishments operating under the factory system, which gave employment to an average of 122,641 persons during the year and paid out \$65,811,000 in salaries and wages. Of the persons employed, 113,538 were wage earners. These establishments

turned out products to the value of \$280,344,000, to produce which materials costing \$158,192,000 were consumed. The value added by manufacture was thus \$122,152,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year.

## STATISTICS OF MANUFACTURES—RHODE ISLAND.

In general, this table brings out the fact that the manufacturing industries of Rhode Island as a whole showed a greater development during the more recent five-year period 1904-1909 than during the preceding five-year period 1899-1904. During the later period the number of establishments increased 20.7 per cent and the average number of wage earners 16.7 per cent, while the value of products increased 38.7 per cent and the value added by manufacture 36.9 per cent. As pointed out in the Introduction, it would be improper to infer that manufactures increased in volume during the period 1904-1909 to the extent indicated by these figures regarding values, since the increase shown

is certainly due, in part, to the increase that has taken place in the price of commodities.

It is a matter of interest to note that the percentages of increase shown for wages, value of products, and value added by manufacture are considerably larger than those for the number of establishments and average number of wage earners. The only decrease shown in the table is that in the number of establishments during the period 1899-1904, amounting to 3.6 per cent.

The relative importance and growth of the leading manufacturing industries of the state are shown in the following table:

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.		PER CENT OF INCREASE. <sup>1</sup>			
		Average number.	Per cent distribution.	Amount.	Per cent distribution.	Amount.	Per cent distribution.	Value of products.		Value added by manufacture.	
								1904-1909	1899-1904	1904-1909	1899-1904
All industries.....	1,951	113,538	100.0	\$280,344,000	100.0	\$122,152,000	100.0	38.7	22.1	36.9	15.0
Woolen, worsted, and felt goods, and wool hats.....	88	24,024	22.0	74,680,000	26.6	23,575,000	19.3	41.7	36.1	41.1	21.1
Cotton goods, including cotton small wares.....	100	28,780	25.4	50,913,000	17.0	24,912,000	20.4	45.5	30.8	07.1	1.1
Jewelry.....	200	0,511	8.4	20,685,000	7.4	10,897,000	8.9	43.3	9.1	40.2	10.2
Foundry and machine-shop products.....	141	10,937	9.6	20,612,000	7.4	12,508,000	10.3	45.2	4.4	37.2	14.5
Electrical machinery, apparatus, and supplies.....	12	1,601	1.4	6,410,000	2.3	1,815,000	1.5	17.0	6.3	28.0	45.0
Silverware and plated ware.....	11	2,294	2.0	6,198,000	2.2	3,563,000	2.9	16.4	25.3	22.0	22.5
Silk and silk goods, including throwsters.....	13	1,685	1.5	4,584,000	1.6	1,360,000	1.1	79.3	05.0	62.3	74.8
Gold and silver, reducing and refining, not from the ore.....	15	82	0.1	4,442,000	1.6	271,000	0.2	4.2	22.3	* 1.1	* 20.8
Bread and other bakery products.....	187	1,055	0.9	3,937,000	1.4	1,466,000	1.2	28.0	41.7	19.2	33.7
Hosiery and knit goods.....	17	1,774	1.6	3,800,000	1.4	1,422,000	1.2	15.6	22.8	32.4	12.6
Printing and publishing.....	147	1,454	1.3	3,780,000	1.3	2,716,000	2.2	23.1	49.0	20.5	50.7
Liquors, malt.....	9	450	0.4	3,579,000	1.3	2,391,000	2.0	30.6	45.7	18.5	41.3
Slaughtering and meat packing.....	21	214	0.2	3,156,000	1.1	302,000	0.3	18.8	2.3	32.0	* 0.6
Lumber and timber products.....	57	738	0.7	1,067,000	0.7	843,000	0.7	12.3	36.2	* 0.6	34.4
Gas, illuminating and heating.....	8	412	0.4	1,833,000	0.7	1,363,000	1.1	16.0	63.1	20.0	48.7
Marble and stone work.....	40	600	0.4	1,031,000	0.4	784,000	0.6	2.0	23.0	2.0	27.0
Copper, tin, and sheet-iron products.....	41	377	0.3	932,000	0.3	480,000	0.4	26.0	104.4	35.2	70.7
Flour-mill and gristmill products.....	18	39	(?)	886,000	0.3	90,000	0.1	* 21.0	* 37.7	28.0	* 70.8
Brass and bronze products.....	18	225	0.2	828,000	0.3	279,000	0.2	24.0	55.0	* 14.4	48.2
Enameling and japanning.....	21	615	0.5	570,000	0.2	424,000	0.3	68.6	27.5	53.6	30.6
Tobacco manufactures.....	65	288	0.2	537,000	0.2	341,000	0.3	50.0	22.2	52.0	10.0
All other industries.....	614	26,427	22.4	65,656,000	23.4	30,218,000	24.7	41.0	11.3	23.7	13.0

<sup>1</sup> Per cent of increase is based on figures in Table I.

<sup>2</sup> Decrease.

<sup>3</sup> Less than one-tenth of 1 per cent.

It should be borne in mind, in considering this table, that the value of products in some of the industries involves a certain amount of duplication due to the use of the product of one establishment in the industry as material for another establishment.

The dyeing and finishing of textiles is the most important of the industries included under the head of "All other industries." It covers the bleaching, dyeing, and mercerizing of raw fiber, yarns, and woven cloth, as well as the printing of cotton piece goods. A considerable number of the cotton, wool, and silk mills in the same establishment combine one or more of these subordinate processes with their manufacture, therefore the statistics for the independent establishments engaged in dyeing and finishing do not fully represent the statistics for the industry. It is of interest, however, to know that there were 45 of these independent establishments reported at the census of 1909, compared with 37 in 1904. The average num-

ber of wage earners employed was 7,792 and 7,562, respectively, for the two census years. Measured by value of products, this industry, with \$13,955,700 in 1909, ranked fifth, compared with other industries of the state. In 1904 Rhode Island, with products valued at \$9,981,457, was the third state in the Union in this class of manufacture, New Jersey being first and Massachusetts second.

In addition to the 20 industries presented separately and dyeing and finishing textiles, there are 21 industries which had a value of products in 1909 in excess of \$500,000. They are included under the head of "All other industries" in the table because in some cases the operations of individual establishments would be disclosed if they were shown separately; in others, the returns do not properly present the true condition of the industry, for the reason that it is more or less interwoven with one or more industries of similar character, while for others comparable

statistics for the different census years can not be presented on account of changes in classification. These industries are: Automobiles, including bodies and parts; baking powder and yeast; rubber boots and shoes; dyestuffs and extracts; files; men's furnishing goods; grease and tallow; steel works and rolling mills; iron and steel, bolts, nuts, washers, and rivets, not made in steel works or rolling mills; cottonseed oil and cake; oleomargarine; paper goods, not elsewhere specified; rubber goods, not elsewhere specified; wood screws; shipbuilding; soap; sporting and athletic goods; washing machines and clothes wringers; waste; and wire. The 1909 statistics, however, for the manufacture of men's furnishing goods, paper goods, and rubber goods, and for the shipbuilding industry are presented in Table II.

Although a few industries greatly predominate in importance, it will be seen from Table II that there is on the whole considerable diversity in the manufacturing activities of the state. The most important industries listed in the table given above, in which they are arranged in the order of the value of products, call for brief consideration.

*Textiles.*—The textile industry of the state—consisting of the manufacture of woolen and worsted goods; cotton goods, including cotton small wares; silk and silk goods, including throwsters; and hosiery and knit goods—is by far the most important branch of manufacture. Combined, the four allied branches gave employment to 57,169 wage earners on the average during the year, and the value of their products amounted to \$133,363,000, these figures representing 50.4 per cent and 47.6 per cent, respectively, of the totals for all industries in the state. Rhode Island ranks fourth among the states in the production of cotton goods, third in woolen and worsted goods, sixth in silk and silk goods, and eleventh in hosiery and knit goods.

*Manufactures from precious metals.*—The manufacture of jewelry is closely allied with the production of silverware and plated ware, and the reduction and refining of gold and silver from sweepings, clippings, and scrap. These three industries combined employed an average of 11,887 wage earners and turned out products valued at \$31,325,000. In 1905 Rhode Island led all other states in the manufacture of jewelry.

*Foundry and machine-shop products.*—The number of establishments engaged in this industry and the degree of their activity in any community are usually a fair index of the extent and prosperity of its manufactures. The industry was really of greater importance in the state than is indicated by the statistics, as some machine shops manufactured a distinctive product and were assigned to other classifications. A number of the most important establishments are engaged in the manufacture of textile machinery.

*Electrical machinery, apparatus, and supplies.*—The establishments engaged in this industry are devoted primarily to the production of insulated wires and

cables, incandescent lamps of carbon filament, and electric-lighting fixtures.

The four groups of industries considered in the immediately preceding paragraphs held the same relative rank when measured by value added by manufacture as when measured by value of products. Treating the industries individually, however, considerable change is noted in their order when ranked according to value added by manufacture. Cotton manufacture displaces woolen and worsted goods from first place, and the foundry and machine-shop industry exchanges places with jewelry. Silverware becomes fifth in order instead of electrical machinery, which drops to eighth place. Printing and publishing and malt liquors become sixth and seventh, respectively, while silk manufacture falls to eleventh place, and gold and silver, reducing and refining, not from the ore, drops to twentieth place.

This table shows also the percentages of increase for these leading industries in respect to value of products and value added by manufacture. The cotton industry showed a greater rate of increase from 1904 to 1909 in value added by manufacture than any other of the specified industries, namely, 67.1 per cent, while during the same period the silk industry showed the greatest rate of increase in value of products, 79.3 per cent. The foundry and machine-shop, jewelry, and woolen industries also showed remarkable increases both in gross value of products and in value added by manufacture.

Two of the specified industries, marble and stone work and flour-mill and gristmill products, showed a decrease in value of products both from 1899 to 1904 and from 1904 to 1909, while all the others showed an increase for both periods. Three industries showed a decrease in value added by manufacture from 1904 to 1909, while four showed a decrease from 1899 to 1904.

*Persons engaged in manufacturing industries.*—The following table shows the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables is an estimate obtained by the method described in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes.....	122,841	81,843	40,798
Proprietors and officials.....	4,109	3,967	152
Proprietors and firm members.....	1,721	1,000	115
Salaried officers of corporations.....	907	885	22
Superintendents and managers.....	1,481	1,466	15
Clerks.....	4,994	3,337	1,657
Wage earners (average number).....	113,538	74,549	38,989
16 years of age and over.....	108,913	72,239	36,674
Under 16 years of age.....	4,625	2,310	2,315

## STATISTICS OF MANUFACTURES—RHODE ISLAND.

The average number of persons engaged in manufactures during 1909 was 122,641. Of these, 113,538 were wage earners. Of the remainder, 4,109, or 45.1 per cent, were proprietors and officials, and 4,994, or 54.9 per cent, clerks. Corresponding figures for individual industries will be found in Table II.

The following table shows the percentage of proprietors and officials, clerks, and wage earners, respectively, in the total number of persons employed in manufactures. It covers all industries combined and 13 important industries individually.

INDUSTRY.	PERSONS ENGAGED IN MANUFACTURES.			
	Total number.	Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
All industries.....	122,641	3.4	4.1	92.6
Bread and other bakery products.....	1,401	17.1	7.0	75.3
Cotton goods, including cotton small wares.....	20,488	1.1	1.3	97.6
Electrical machinery, apparatus, and supplies.....	1,730	2.3	5.2	92.5
Poundry and machine-shop products.....	11,005	3.5	4.7	91.9
Gold and silver, reducing and refining, not from the ore.....	142	20.1	10.2	57.7
Hosiery and knit goods.....	1,849	2.0	2.1	95.0
Jewelry.....	11,002	5.7	7.8	86.4
Liquors, malt.....	543	5.2	12.0	82.0
Printing and publishing.....	2,049	11.2	17.8	71.0
Silk and silk goods, including throwsters.....	1,700	2.1	1.0	96.3
Silverware and plated ware.....	2,517	1.4	7.4	91.1
Slaughtering and meat packing.....	207	12.4	7.5	80.1
Woolen, worsted, and felt goods, and wool hats.....	25,073	1.4	1.5	97.1
All other industries.....	32,325	5.2	5.8	89.0

Of the total number of persons engaged in all manufacturing industries, 3.4 per cent were proprietors and officials, 4.1 per cent clerks, and 92.6 per cent wage earners. The highest percentage of proprietors and officials shown for any individual industry, 26.1, is for the establishments engaged in reducing and refining gold and silver from sweepings, clippings, and scrap; measured by number of persons engaged the establishments in this industry are generally small. In the bakery and the printing and publishing industries the majority of the establishments are also small and the work is to a large extent done by the proprietors or their immediate representatives, so that the proportion of persons engaged in these industries falling in the class of proprietors and officials is very much higher than for most other industries or for all industries combined. The high percentage shown for the slaughtering and meat-packing industry is due to the fact that a number of the establishments classified under this head are small establishments engaged exclusively in the manufacture of sausage.

On account of the large average number of wage earners to an individual establishment in the cotton, woolen, and silverware industries, these industries

show the smallest proportion of proprietors and officials.

The following table shows, in percentages, for all industries combined, the distribution of the average number of wage earners, by age periods and sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries separately, the percentage distribution, by age periods and sex, of wage earners as reported for December 15 or the nearest representative day. As a means of judging the importance of the several industries the average total number employed for the year is also given in each case.

INDUSTRY.	WAGE EARNERS.			
	Average number. <sup>1</sup>	Per cent of total.		
		16 years of age and over.		Under 16 years of age.
		Male.	Female.	
All industries.....	113,538	63.6	32.3	4.1
Bread and other bakery products.....	1,055	91.7	7.6	0.8
Cotton goods, including cotton small wares.....	28,780	50.7	43.3	6.0
Electrical machinery, apparatus, and supplies.....	1,601	58.7	39.1	2.2
Poundry and machine-shop products.....	10,937	97.3	1.6	1.1
Gold and silver, reducing and refining, not from the ore.....	82	100.0		
Hosiery and knit goods.....	1,774	19.0	73.1	7.0
Jewelry.....	9,511	55.8	40.0	2.6
Liquors, malt.....	450	100.0		
Printing and publishing.....	1,454	70.8	20.8	2.1
Silk and silk goods, including throwsters.....	1,685	43.0	53.2	3.2
Silverware and plated ware.....	2,204	80.0	0.2	1.7
Slaughtering and meat packing.....	214	98.6		1.4
Woolen, worsted, and felt goods, and wool hats.....	24,924	52.1	41.7	6.2
All other industries.....	28,771	75.0	21.8	2.5

<sup>1</sup> For method of estimating the distribution, by sex and age periods, of the average number in all industries combined, see Introduction.

For all industries combined, 63.6 per cent of the average number of wage earners were males over 16 years of age; 32.3 per cent females over 16 years of age; and 4.1 per cent persons of both sexes under the age of 16. The larger part of the total number of female wage earners is made up of those employed in the textile industries. In the cotton-goods industry over two-fifths of the employees are women over 16 years of age, in the hosiery and knit-goods industry the proportion is nearly three-fourths, in the silk industry over one-half, and in the woolen and worsted industry over two-fifths. The manufacture of electrical machinery, apparatus, and supplies, and the jewelry industry, also show a large proportion of female wage earners, 39.1 per cent and 40.6 per cent, respectively. If the four textile industries are excluded, females over 16 employed in all industries combined represent 20.6 per cent of the total number of wage earners.

The four textile industries combined also include the larger part of the total number of wage earners under 16 years of age. The proportions of such em-

ployees engaged in each industry were as follows: Cotton goods, 6 per cent; hosiery and knit goods, 7 per cent; silk, 3.2 per cent; and woolen and worsted, 6.2 per cent.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904 it is necessary to use the classification employed at the earlier census. (See Introduction.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				
	1909		1904		Per cent of Increase, 1904-1909.
	Number.	Per cent distribution.	Number.	Per cent distribution.	
Total.....	122,641	100.0	104,299	100.0	17.6
Proprietors and firm members.....	1,721	1.4	1,561	1.5	10.2
Salaried employees.....	7,382	6.0	5,420	5.2	36.2
Wage earners (average number)....	113,538	92.6	97,318	93.3	16.7

Comparable figures are not obtainable for 1899. The table shows a greater percentage of increase in the salaried employees than in the other two classes.

The following table shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over according to sex, for 1909, 1904, and 1899. The averages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

This table indicates that for all industries combined there has been a decrease during the 10 years in the

employment of children under 16 years of age, although from 1899 to 1904 the total number of children employed increased. There has not been much change in the proportion of male and female wage earners. In 1909 males 16 years of age and over formed 63.6 per cent of all wage earners, as compared with 63 per cent in 1904 and 62.7 per cent in 1899.

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Total.....	113,538	100.0	97,318	100.0	83,197	100.0
16 years of age and over..	108,013	95.9	92,088	94.6	83,212	94.3
Male.....	72,239	63.6	61,346	63.0	55,305	62.7
Female.....	35,674	32.3	30,742	31.6	27,907	31.6
Under 16 years of age....	4,025	4.1	5,230	5.4	4,985	5.7

Wage earners employed by months.—The following table gives the number of wage earners employed on the 15th of each month during the year 1909, for all industries combined, for the cotton goods, foundry and machine shop, jewelry, and woolen and worsted industries, and for all other industries combined; it gives also the percentage which the number reported for each month is of the greatest number reported for any month. In Table II, page 22, is shown, for each industry in the state, the largest number and also the smallest number of employees reported for any month. The number for each month relates to the 15th day, or the nearest representative day, of that month.

MONTH.	NUMBER OF WAGE EARNERS.											
	All Industries.		Cotton goods, including cotton small wares.		Foundry and machine-shop products.		Jewelry.		Woolen, worsted, and felt goods, and wool hats.		All other industries.	
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January.....	108,773	91.3	28,807	98.7	9,301	73.4	9,203	82.7	24,072	94.1	37,300	89.3
February.....	109,615	92.0	28,738	98.4	9,507	75.5	8,930	79.5	24,480	95.6	37,891	90.7
March.....	111,024	93.0	28,806	99.0	10,062	79.4	8,928	79.4	25,420	99.3	38,600	92.4
April.....	111,320	93.4	28,806	98.7	10,216	80.6	8,430	75.1	24,880	97.2	38,970	93.3
May.....	111,052	93.0	28,818	98.7	10,318	81.4	8,625	76.7	25,128	98.1	39,063	93.5
June.....	112,055	94.0	28,632	98.1	10,633	83.9	8,774	78.1	25,203	98.4	38,813	92.9
July.....	111,571	93.6	28,611	98.0	11,113	87.7	8,574	76.3	24,811	96.9	38,462	92.1
August.....	112,835	94.7	28,342	97.1	11,388	89.8	9,007	80.9	24,800	96.9	39,208	93.8
September.....	116,116	97.4	28,722	98.4	11,566	91.2	10,201	90.8	25,604	100.0	40,023	95.8
October.....	118,007	98.0	28,706	98.6	12,015	94.8	10,883	96.8	25,305	99.1	40,948	98.0
November.....	119,104	98.9	29,080	99.6	12,382	97.7	11,145	99.2	25,011	97.7	41,480	99.3
December.....	119,191	100.0	29,102	100.0	12,678	100.0	11,238	100.0	24,302	94.9	41,781	100.0

There are no seasonal industries of importance in Rhode Island which give employment to a large number of persons at certain periods of the year only. On the contrary, all of the more important industries show comparatively little fluctuation in the number of wage earners employed. Among the industries covered by the above table the greatest variation is shown

in the foundry and machine-shop industry, in which the smallest number, 9,301, were employed in the month of January. The number constantly increased from month to month, however, to the end of the year, when 12,678 were employed, a difference of 3,377 from that at the beginning of the year. In the cotton mills the greatest activity was in December and the next

## STATISTICS OF MANUFACTURES—RHODE ISLAND.

greatest in November. The smallest number were employed in August, but represented a difference of only 850, or 2.9 per cent, from the largest number. In the woolen mills September was the month when the most wage earners were employed, while the fewest were employed in January. April was the month of least activity in the jewelry industry and November and December the months of greatest activity.

Prevailing hours of labor.—In the following table

wage earners have been classified according to hours of labor prevailing in the establishments in which they are employed. In making this classification the average number of wage earners employed during the year is used, and the number employed in each establishment is classified as a total according to the hours prevailing in that establishment, even though some few employees work a greater or less number of hours.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries.....	113,538	2,672	1,484	7,001	92,597	9,388	163	30	203
Brass and bronze products.....	225			2	145	78			
Bread and other bakery products.....	1,055	104	20	136	99	627	40	23	
Copper, tin, and sheet-iron products.....	377	206	18	11	142				
Cotton goods, including cotton small wares.....	28,786			34	23,658	94			
Electrical machinery, apparatus, and supplies.....	1,001	1	6	158	1,400	27			
Enamelling and japanning.....	615		78		520	8			
Flour-mill and gristmill products.....	39				22	17			
Foundry and machine-shop products.....	10,937	9	348	1,221	8,411	948			
Gas, illuminating and heating.....	412				1	282	83		46
Gold and silver, reducing and refining, not from the ore.....	32				70	12			
Hosiery and knit goods.....	1,774		1		1,762	71			
Jewelry.....	9,511	573	53	167	7,500	1,218			
Liquors, malt.....	450			449		1			
Lumber and timber products.....	748	77	13	101	267	200			
Marble and stone work.....	660	618	13	23		1			
Printing and publishing.....	1,464	529	525	98	278	21	3		
Silk and silk goods, including throwsters.....	1,685				1,685				
Silverware and plated ware.....	2,204			2	2,202				
Slaughtering and meat packing.....	214	1	1	31	88	93			
Tobacco manufactures.....	268	236	2	5	22	3			
Woolen, worsted, and felt goods, and wool hats.....	24,924	2	95	284	22,748	1,705			
All other industries.....	25,427	316	311	4,184	16,520	3,592	31	7	157

It is evident from these figures that for the great majority of wage earners employed in the manufacturing industries of Rhode Island the prevailing hours of labor range from 54 to 60 a week, or from 9 to 10 hours a day, only 3.7 per cent of the total being employed in establishments working less than 9 hours a day and only three-tenths of 1 per cent being employed in establishments working more than 10 hours a day.

It will be noted that in all of the larger industries

the employment is mainly confined to a week of "between 54 and 60 hours." Practically all of the wage earners in the gas industry, however, are in plants operating 60 hours a week or over, while for the majority of the wage earners in the bakery industry the prevailing hours of labor are 60 per week.

Location of establishments.—The next table shows how largely manufacturing in the state is centralized in cities and towns of 10,000 inhabitants or over. (See Introduction.)

ITEM.	Year.	Aggregate.	CITIES AND TOWNS HAVING A POPULATION OF 10,000 AND OVER.								DISTRICTS OUTSIDE OF CITIES AND TOWNS HAVING A POPULATION OF 10,000 AND OVER.	
			Total.		10,000 to 25,000.		25,000 to 100,000.		100,000 and over.		Number or amount.	Per cent of total.
			Number or amount.	Per cent of total.	Number or amount.	Per cent of total.	Number or amount.	Per cent of total.	Number or amount.	Per cent of total.		
Population.....	1910	437,627	80.7	60,776	12.9	143,525	26.4	224,326	41.3	104,983	19.3	
	1900	330,437	77.1	87,405	20.4	67,437	15.7	175,597	41.0	98,110	22.9	
Number of establishments.....	1909	1,656	84.9	126	6.5	450	23.1	1,080	55.4	205	15.1	
	1904	1,320	81.6	150	9.3	289	17.9	881	54.5	297	18.4	
	1899	1,358	80.9	134	8.0	295	17.6	928	55.4	320	10.1	
Average number of wage earners.....	1909	61,142	80.3	11,586	10.2	33,178	20.2	46,381	40.8	22,306	19.7	
	1904	71,943	73.9	11,413	11.7	20,726	21.3	39,804	40.9	25,375	26.1	
	1899	66,718	75.6	10,047	11.4	18,303	20.8	38,368	43.5	21,479	24.4	
Value of products.....	1909	\$226,191,505	80.7	\$28,068,350	10.0	\$77,832,571	27.8	\$120,240,584	42.0	\$54,152,292	19.3	
	1904	167,761,715	78.1	20,073,316	10.2	45,107,436	22.3	91,080,963	45.5	44,347,868	21.0	
	1899	131,529,623	70.4	18,856,038	11.4	34,016,482	20.5	78,657,103	47.5	34,020,750	20.6	
Value added by manufacture....	1909	101,209,421	82.9	12,122,100	9.9	33,616,782	27.5	55,470,530	45.4	20,042,802	17.1	
	1904	70,514,173	79.0	8,080,377	9.1	20,417,143	22.9	42,007,858	47.1	18,723,149	21.0	
	1899	61,111,305	78.8	8,134,338	10.5	16,870,528	21.7	36,106,430	46.5	16,487,207	21.2	

In 1909, 80.7 per cent of the total value of products was reported from cities and towns having over 10,000 inhabitants, and 80.3 per cent of the average number of wage earners were employed in such cities and towns. The figures indicate that while very little relative change took place during the last 5 or 10 years, yet on the whole the industries of the manufacturing cities and larger towns have gained very slightly on those of the districts outside during the last decade.

The group of cities and towns having between 10,000 and 25,000 inhabitants consisted in 1910 of Central Falls, Cranston, Cumberland, and East Providence, and those having between 25,000 and 100,000 inhabitants comprise Newport, Pawtucket, Warwick, and Woonsocket. Providence is the only city having more than 100,000 inhabitants.

The population in 1900 was used as the basis in making the classification for 1904 as well as 1899. The increase in the population of different cities has affected the grouping in the table. In 1900 Newport and Warwick were in the first group, but during the following decade the population of each increased so that both now fall in the second group. Prior to 1910 Cumberland had less than 10,000 inhabitants, and so was not included in that group.

The first group shows a proportional loss and the second group a gain in 1909, as compared with 1904, while the manufacturing industries of Providence show a slight decrease in relative importance, although a decided absolute gain was returned for all items. Of the total value of products reported for the state in 1909, 10 per cent was reported from the four cities and towns of the first group, 27.8 per cent from the four cities and towns of the second group, and 42.9 per cent from Providence alone.

The relative importance of each of the nine cities having a population of 10,000 or over in 1910 is shown in the following table, in which the value of products and average number of wage earners are shown separately for 1909, 1904, and 1899:

CITY OR TOWN.	AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.		
	1909	1904	1899	1909	1904	1899
Providence.....	46,381	39,804	38,368	\$120,240,584	\$91,980,063	\$78,657,103
Pawtucket.....	15,275	12,054	10,712	37,696,186	25,846,899	19,271,582
Woonsocket.....	10,793	8,072	7,591	28,218,515	19,260,537	14,744,000
Warwick.....	6,471	6,153	5,465	10,588,943	7,051,971	6,019,989
Cumberland <sup>1</sup> .....	5,359	4,574	1,500	9,826,720	5,965,027	1,756,288
East Providence <sup>1</sup> .....	2,041	1,381	836	7,145,977	5,544,376	5,347,316
Cranston <sup>1</sup> .....	1,711	587	493	5,024,714	1,638,881	1,402,359
Central Falls.....	2,475	2,443	2,372	5,470,939	5,090,984	4,511,182
Newport.....	726	849	881	1,378,927	1,347,104	1,575,192

<sup>1</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the cities.

Every city shows an increase in value of products from 1904 to 1909, and all but Newport an increase from 1899 to 1904. The percentages of increase, how-

ever, were generally greater from 1904 to 1909. The greatest gain, 243.2 per cent, was made by Cranston, and was due in part to the establishment of such new industries as the manufacture of automobiles, foundry and machine shops, and street-railway repair shops. The next largest increase, 64.7 per cent, is shown for Cumberland, and was due mostly to the increased production of the cotton mills of that town. Manufacturing in Newport was practically at a standstill from 1904 to 1909, as there was scarcely any change in the value of products and a decrease in the average number of wage earners. The totals presented for Newport do not include the statistics for the naval torpedo station in that city, operated by the Federal Government. In 1909 this plant employed an average of 270 wage earners and turned out products valued at \$471,712.

Providence, the largest and most important city in the state, shows an increase in 1909, as compared with 1904, of \$28,259,621, or 30.7 per cent, in value of products, and 6,577, or 16.5 per cent, in the average number of wage earners. The relative importance of Providence as a manufacturing city is indicated by comparing it with the leading cities of the United States. This comparison shows that when ranked by value of products it was seventeenth both in 1899 and 1904. About one-fourth of the total value of the textile products of the state was reported from this city. Practically all of the establishments of the state engaged in manufactures from the precious metals were in Providence, 98.4 per cent of the value of products of these industries being credited to this city. All of the establishments engaged in "gold and silver refining, not from the ore," and in the production of silverware and plated ware were located here. Seventy and three-tenths per cent of the total value of the foundry and machine-shop products of the state was reported from Providence.

Pawtucket, Woonsocket, and Warwick still maintain their importance in the manufacture of textiles, these industries contributing 53.4, 70.5, and 77.8 per cent, respectively, of the total value of products of these places. In Woonsocket the woolen mills are the most important textile establishments, while in Pawtucket and Warwick cotton mills predominate.

**Character of ownership.**—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available. Figures for 1909 only are presented for several important industries. In order to avoid disclosing the operations of individual concerns it is necessary to omit several important industries from this and the table following.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>				
1909.....	1,951	113,538	\$280,343,797	\$122,152,223
1904.....	1,617	97,318	202,109,583	89,237,322
Individual:				
1909.....	955	8,888	18,425,145	9,408,377
1904.....	754	8,858	18,576,416	9,124,529
Firm:				
1909.....	329	8,849	18,464,914	8,229,493
1904.....	347	11,653	25,193,561	9,465,620
Corporation:				
1909.....	659	95,794	243,426,908	104,490,185
1904.....	512	70,803	158,322,601	70,646,328
Other:				
1909.....	8	7	26,740	24,168
1904.....	4	4	12,005	10,845
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
Individual:				
1909.....	48.9	7.8	6.6	7.7
1904.....	46.6	9.1	9.2	10.2
Firm:				
1909.....	16.9	7.8	6.6	6.7
1904.....	21.5	12.0	12.5	10.6
Corporation:				
1909.....	33.8	84.4	86.8	85.5
1904.....	31.7	78.9	78.3	79.2
Other:				
1909.....	0.4	(1)	(1)	(1)
1904.....	0.2	(1)	(1)	(1)
<b>Bread and other bakery products, 1909.....</b>	<b>187</b>	<b>1,055</b>	<b>\$3,936,864</b>	<b>\$1,466,806</b>
Individual.....	147	448	1,022,159	589,059
Firm.....	28	219	887,370	322,692
Corporation.....	12	388	1,427,329	554,555
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	78.6	42.5	41.2	40.2
Firm.....	15.0	20.8	22.5	22.0
Corporation.....	6.4	36.8	36.3	37.8
<b>Cotton goods, including cotton small wares, 1909.....</b>	<b>106</b>	<b>28,786</b>	<b>\$50,312,597</b>	<b>\$24,911,358</b>
Individual.....	8	62	163,448	61,592
Firm.....	12	3,004	5,092,593	2,343,253
Corporation.....	86	25,120	45,056,556	22,506,513
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	7.5	0.2	0.3	0.2
Firm.....	11.3	12.5	10.1	9.4
Corporation.....	81.1	87.3	89.6	90.3
<b>Foundry and machine-shop products, 1909.....</b>	<b>141</b>	<b>10,937</b>	<b>\$20,611,693</b>	<b>\$12,598,192</b>
Individual.....	57	550	1,332,787	745,750
Firm.....	14	149	333,406	195,866
Corporation.....	70	10,238	18,945,500	11,656,576
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	40.4	5.0	6.5	5.9
Firm.....	9.9	1.4	1.6	1.6
Corporation.....	49.6	93.6	91.9	92.5
<b>Jewelry, 1909.....</b>	<b>296</b>	<b>9,511</b>	<b>\$20,685,100</b>	<b>\$10,897,063</b>
Individual.....	132	2,367	3,303,671	2,047,067
Firm.....	73	2,126	4,121,705	2,485,517
Corporation.....	91	5,018	13,259,724	6,364,479
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	44.6	24.9	16.0	18.8
Firm.....	24.7	22.4	19.9	22.8
Corporation.....	30.7	52.8	64.1	58.4
<b>Printing and publishing, 1909.....</b>	<b>147</b>	<b>1,454</b>	<b>\$3,780,075</b>	<b>\$2,716,400</b>
Individual.....	86	305	629,556	472,949
Firm.....	25	127	259,822	194,093
Corporation.....	28	1,015	2,863,957	2,025,190
Other.....	8	7	26,740	24,168
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	58.5	21.0	16.7	17.4
Firm.....	17.0	8.7	6.9	7.1
Corporation.....	19.0	69.3	75.8	74.6
Other.....	5.4	0.5	0.7	0.9
<b>Woolen, worsted, and felt goods, and wool hats, 1909.....</b>	<b>88</b>	<b>24,924</b>	<b>\$74,600,240</b>	<b>\$23,574,864</b>
Individual.....	10	456	806,531	345,100
Firm.....	6	573	1,009,431	387,133
Corporation.....	72	23,895	72,784,278	22,842,631
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	11.4	1.8	1.1	1.5
Firm.....	6.8	2.3	1.4	1.6
Corporation.....	81.8	95.9	97.6	96.9

<sup>1</sup> Less than one-tenth of 1 per cent.

The most important distinction shown is that between corporate and all other forms of ownership. For all industries combined, 33.8 per cent of the total number of establishments were in 1909 under corpo-

rate ownership, as against 66.2 per cent under all other forms. The corresponding figures for 1904 were 31.7 per cent and 68.3 per cent, respectively. In respect to value of products the difference was even more pronounced, for in 1909 the establishments operated by corporations reported 86.8 per cent of the total value, as against 13.2 per cent for those under all other forms of ownership, while in 1904 the corresponding figures were 78.3 per cent and 21.7 per cent, respectively. The greatest relative decrease from 1904 to 1909 is shown for establishments operated by firms, which represented only 16.9 per cent of the total number of establishments in 1909, as compared with 21.5 per cent in 1904.

**Size of establishment.**—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it the following table groups the establishments according to the value of their products. The table also shows the average size of establishments for all industries combined and for important industries separately as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the last two censuses, while for certain important industries figures are given for 1909 only.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>				
1909.....	1,951	113,538	\$280,343,797	\$122,152,223
1904.....	1,617	97,318	202,109,583	89,237,322
Less than \$5,000:				
1909.....	477	707	1,160,084	795,432
1904.....	308	449	807,109	552,428
\$5,000 and less than \$20,000:				
1909.....	579	3,244	5,891,800	3,510,241
1904.....	523	2,955	5,392,825	3,277,555
\$20,000 and less than \$100,000:				
1909.....	459	10,742	21,304,255	11,231,441
1904.....	428	9,595	18,617,859	10,035,392
\$100,000 and less than \$1,000,000:				
1909.....	367	49,719	116,696,463	52,043,520
1904.....	317	50,490	97,235,874	43,774,550
\$1,000,000 and over:				
1909.....	69	49,126	135,285,205	54,571,580
1904.....	41	33,829	80,055,016	31,597,457
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
Less than \$5,000:				
1909.....	24.4	0.6	0.4	0.7
1904.....	19.0	0.5	0.4	0.6
\$5,000 and less than \$20,000:				
1909.....	29.7	2.9	2.1	2.9
1904.....	32.3	3.0	2.7	3.7
\$20,000 and less than \$100,000:				
1909.....	23.5	9.5	7.6	9.2
1904.....	26.5	9.9	9.2	11.2
\$100,000 and less than \$1,000,000:				
1909.....	18.8	43.8	41.6	42.6
1904.....	19.6	51.9	48.1	49.1
\$1,000,000 and over:				
1909.....	3.5	43.3	48.3	44.7
1904.....	2.5	34.8	39.6	35.4
Average per establishment:				
1909.....	.....	58	\$143,692	\$62,610
1904.....	.....	60	124,990	55,187
<b>Bread and other bakery products, 1909.....</b>	<b>187</b>	<b>1,055</b>	<b>\$3,936,864</b>	<b>\$1,466,806</b>
Less than \$5,000.....	47	36	151,596	60,147
\$5,000 and less than \$20,000.....	100	293	1,000,645	809,731
\$20,000 and less than \$100,000.....	33	395	1,478,007	521,732
\$100,000 and less than \$1,000,000.....	7	331	1,306,616	490,556
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	25.1	3.4	3.9	4.1
\$5,000 and less than \$20,000.....	53.5	27.8	25.4	26.9
\$20,000 and less than \$100,000.....	17.6	37.4	37.5	35.6
\$100,000 and less than \$1,000,000.....	3.7	31.4	33.2	33.5
Average per establishment.....	.....	6	\$21,053	\$7,841

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>Cotton goods, including cotton small wares, 1909.</b>	<b>106</b>	<b>28,786</b>	<b>\$50,312,597</b>	<b>\$24,911,858</b>
Less than \$5,000.....	3	5	8,900	5,413
\$5,000 and less than \$20,000.....	4	52	52,851	31,387
\$20,000 and less than \$100,000.....	27	970	1,464,968	622,177
\$100,000 and less than \$1,000,000.....	58	15,294	25,640,252	12,531,368
\$1,000,000 and over.....	14	12,465	23,145,626	11,721,013
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	2.8	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
\$5,000 and less than \$20,000.....	3.8	0.2	0.1	0.1
\$20,000 and less than \$100,000.....	25.5	3.4	2.9	2.5
\$100,000 and less than \$1,000,000.....	54.7	53.1	51.0	50.3
\$1,000,000 and over.....	13.2	43.3	46.0	47.1
Average per establishment.....		272	\$474,647	\$235,013
<b>Foundry and machine-shop products, 1909.</b>	<b>141</b>	<b>10,937</b>	<b>\$20,611,693</b>	<b>\$12,598,192</b>
Less than \$5,000.....	17	20	40,866	31,279
\$5,000 and less than \$20,000.....	47	261	478,459	323,116
\$20,000 and less than \$100,000.....	43	1,036	2,002,782	1,209,731
\$100,000 and less than \$1,000,000.....	30	4,808	9,417,948	5,579,126
\$1,000,000 and over.....	4	4,812	8,612,538	5,454,940
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	12.1	0.2	0.2	0.2
\$5,000 and less than \$20,000.....	33.3	2.4	2.3	2.6
\$20,000 and less than \$100,000.....	30.5	9.5	10.0	9.6
\$100,000 and less than \$1,000,000.....	21.3	44.0	45.7	44.3
\$1,000,000 and over.....	2.8	44.0	41.8	44.3
Average per establishment.....		78	\$140,182	\$89,340
<b>Jewelry, 1909.</b>	<b>298</b>	<b>9,511</b>	<b>\$20,685,100</b>	<b>\$10,897,063</b>
Less than \$5,000.....	58	234	132,701	100,000
\$5,000 and less than \$20,000.....	46	602	681,340	480,447
\$20,000 and less than \$100,000.....	108	3,225	5,364,684	3,313,363
\$100,000 and less than \$1,000,000.....	64	5,450	14,516,375	6,004,163
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	19.6	2.5	0.6	1.0
\$5,000 and less than \$20,000.....	22.3	6.3	3.3	4.4
\$20,000 and less than \$100,000.....	36.5	33.9	25.9	30.4
\$100,000 and less than \$1,000,000.....	21.0	57.3	70.2	64.2
Average per establishment.....		32	\$69,882	\$36,814
<b>Printing and publishing, 1909.</b>	<b>147</b>	<b>1,454</b>	<b>\$3,780,075</b>	<b>\$2,718,400</b>
Less than \$5,000.....	71	78	170,498	134,733
\$5,000 and less than \$20,000.....	45	218	403,522	303,444
\$20,000 and less than \$100,000.....	23	377	906,860	677,176
\$100,000 and less than \$1,000,000.....	8	781	2,299,146	1,601,047
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	48.3	5.4	4.5	5.0
\$5,000 and less than \$20,000.....	30.6	15.0	10.7	11.2
\$20,000 and less than \$100,000.....	15.6	25.9	24.0	24.9
\$100,000 and less than \$1,000,000.....	5.4	53.7	60.8	58.9
Average per establishment.....		10	\$25,715	\$18,479
<b>Woolen, worsted, and felt goods, and wool hats, 1909.</b>	<b>88</b>	<b>24,924</b>	<b>\$74,000,240</b>	<b>\$23,574,864</b>
Less than \$5,000.....	4	8	13,600	9,292
\$5,000 and less than \$20,000.....	12	375	521,973	238,787
\$20,000 and less than \$100,000.....	49	7,651	21,506,311	6,467,645
\$100,000 and over.....	23	16,890	52,559,266	16,859,140
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	4.5	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
\$20,000 and less than \$100,000.....	13.6	1.5	0.7	1.0
\$100,000 and less than \$1,000,000.....	55.7	30.7	28.8	27.4
\$1,000,000 and over.....	26.1	67.8	70.5	71.5
Average per establishment.....		283	\$847,730	\$267,890

This table shows that, in 1909, of the 1,951 establishments only 69, or 3.5 per cent, had a value of product exceeding \$1,000,000. These establishments, however, had an average number of wage earners of 49,126, or 43.3 per cent, of the total number in all establishments, and reported 48.3 per cent of the total value of products, and 44.7 per cent of the total value added by manufacture.

On the other hand, the very small establishments—that is, those having a value of products of less than \$5,000—constituted a very considerable proportion (24.4 per cent) of the total number of establishments, but the value of their products amounted to only four-tenths of 1 per cent of the total. The great bulk of the manufacturing was carried on in establishments having a product valued at not less than \$100,000.

It will be seen from the above table that during the five years from 1904 to 1909 there was a considerable increase in the relative importance of the largest establishments—those reporting products of not less than \$1,000,000 in value—and a decrease in that of all other classes.

The fact that the average value of products per establishment increased from \$124,990 to \$143,692, and the value added by manufacture from \$55,187 to \$62,610, can scarcely be taken as in itself indicating a tendency toward concentration. The increased values shown may be, and probably are, due in part to the increase that has taken place in the prices of commodities. The average number of wage earners per establishment decreased by two.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The next table shows such a classification for all industries combined and for 13 important industries individually, and gives not only the number of establishments falling in each group but also the average number of wage earners employed.

<sup>1</sup> Less than one-tenth of 1 per cent.

<sup>2</sup> Includes establishments with products valued at \$1,000,000 and over.

<sup>3</sup> Includes the group "\$5,000 and less than \$20,000."

## STATISTICS OF MANUFACTURES—RHODE ISLAND.

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All industries.....	1,951	156	746	452	216	143	121	74	28	15
Bread and other bakery products.....	187	27	112	40	6	1	1			
Cotton goods, including cotton small wares.....	106		4	10	15	15	20	25	12	5
Electrical machinery, apparatus, and supplies.....	12		4	1	2		3	1	1	
Foundry and machine-shop products.....	141	6	38	41	21	17	7	8	2	1
Gold and silver, reducing and refining, not from the ore.....	15		9	6						
Hosiery and knit goods.....	17		1	3	3	3	5	2		
Jewelry.....	206	8	66	90	73	40	18		1	
Liquors, malt.....	9	1	1	1	3	2	1			
Printing and publishing.....	147	29	75	32	5	2	4			
Silk and silk goods, including throwsters.....	13		4	1	4		4			
Silverware and plated ware.....	11		1	1	5		2			1
Slaughtering and meat packing.....	21	2	11	6		1				
Woolen, worsted, felt goods, and wool hats.....	88		4	5	8	16	28	10	7	4
All other industries.....	888	83	420	212	74	40	32	18	5	4
AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	113,538	1,922	5,124	7,211	10,141	10,538	25,828	18,888	24,891	
Bread and other bakery products.....	1,055	275	409	200	50	106				
Cotton goods, including cotton small wares.....	28,780	10	130	502	1,080	3,481	8,895	7,711	0,977	
Electrical machinery, apparatus, and supplies.....	1,601	10	6	53		600	208	734		
Foundry and machine-shop products.....	10,937	120	376	673	1,240	1,240	2,799	1,125	3,304	
Gold and silver, reducing and refining, not from the ore.....	82	29	53							
Hosiery and knit goods.....	1,774	1	32	96	191	875	579			
Jewelry.....	9,511	204	1,062	2,418	2,718	2,508		511		
Liquors, malt.....	450	1	12	118	143	176				
Printing and publishing.....	1,454	180	381	211	136	544				
Silk and silk goods, including throwsters.....	1,085		46	45	284		1,310			
Silverware and plated ware.....	2,204	2	13	174	68	313			1,724	
Slaughtering and meat packing.....	214	23	53		138					
Woolen, worsted, felt goods, and wool hats.....	24,924	8	75	203	1,172	4,704	5,467	5,288	7,857	
All other industries.....	28,771	1,059	2,476	2,419	2,913	4,941	6,480	3,514	4,969	
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	100.0	1.7	4.5	6.4	8.9	17.2	22.7	16.6	21.0	
Bread and other bakery products.....	100.0	26.1	38.8	19.8	5.3	10.0				
Cotton goods, including cotton small wares.....	100.0	( <sup>1</sup> )	0.5	1.7	3.8	12.1	30.9	26.8	24.2	
Electrical machinery, apparatus, and supplies.....	100.0	0.6	0.4	3.3		31.2	18.6	45.8		
Foundry and machine-shop products.....	100.0	1.1	3.4	6.2	11.3	11.3	25.6	10.3	30.8	
Gold and silver, reducing and refining, not from the ore.....	100.0	35.4	64.6							
Hosiery and knit goods.....	100.0	0.1	1.8	5.4	10.8	49.3	32.6			
Jewelry.....	100.0	2.1	11.2	25.4	28.0	27.3		5.4		
Liquors, malt.....	100.0	0.2	2.7	26.2	31.8	39.1				
Printing and publishing.....	100.0	12.4	26.2	14.5	9.5	37.4				
Silk and silk goods, including throwsters.....	100.0		4.2	4.1	26.9		77.7			
Silverware and plated ware.....	100.0	0.1	0.6	7.6	3.0	13.6			75.2	
Slaughtering and meat packing.....	100.0	10.7	24.8		64.5					
Woolen, worsted, felt goods, and wool hats.....	100.0	( <sup>1</sup> )	0.3	1.2	4.7	19.1	21.0	21.2	31.5	
All other industries.....	100.0	3.7	8.6	8.4	10.1	17.2	22.5	12.2	17.3	

<sup>1</sup> Less than one-tenth of 1 per cent.

The per cent distribution of the number of establishments is not shown in this table; of the 1,951 establishments reported for all industries, 8 per cent employed no wage earners; 38.2 per cent, 1 to 5; 23.2 per cent, 6 to 20; and 11.1 per cent, 21 to 50. The most numerous single group consists of the 746 establishments employing 1 to 5 wage earners, and the next of the 452 establishments employing from 6 to 20 wage earners. There were 117 establishments that employed over 250 wage earners; 15 employed over 1,000, of which 5 were cotton mills and 4 woolen mills.

Of the total number of wage earners, 61.2 per cent were in establishments employing over 250 wage earners. The single group having the largest number of employees was the group comprising the establish-

ments employing from 251 to 500 wage earners. This group employed 25,828 wage earners, or 22.7 per cent of the total. The individual industries listed in this table, but not in the preceding one, namely, electrical machinery, hosiery and knit goods, silk, and silverware and plated ware, are all industries in which comparatively large establishments do most of the business, as appears from the classification according to the number of wage earners.

**Expenses.**—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses which make up the total.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
<b>All industries</b> .....	4.4	22.8	65.3	7.5
Bread and other bakery products.....	2.4	18.9	70.9	7.8
Cotton goods, including cotton small wares.....	3.3	29.1	62.6	5.1
Electrical machinery, apparatus, and supplies.....	3.1	11.7	70.4	5.8
Foundry and machine-shop products.....	6.5	37.6	43.6	12.3
Gold and silver, reducing and refining, not from the ore.....	1.0	1.3	95.8	1.2
Hosiery and knit goods.....	4.4	18.8	72.3	4.6
Jewelry.....	8.0	26.4	54.4	10.6
Liquors, malt.....	5.7	13.6	42.0	38.6
Printing and publishing.....	16.6	32.1	35.8	15.5
Silk and silk goods, including throwsters.....	1.9	18.7	75.7	3.7
Silverware and plated ware.....	4.6	28.5	47.9	18.9
Slaughtering and meat packing.....	1.8	4.1	93.0	1.2
Woolen, worsted, and felt goods, and wool hats.....	2.0	17.3	76.5	4.2
All other industries.....	5.8	22.8	62.4	9.0

The foregoing table shows in percentages the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II.

This table shows that, for all industries combined, 65.3 per cent of the total expenses were incurred for materials, 27.2 per cent for services, that is, salaries and wages, and but 7.5 per cent for other purposes. As would be expected, these proportions vary greatly in the different industries.

**Engines and power.**—The following table shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

The table indicates that the increase in primary power was in power generated by steam and gas engines and water wheels, that generated by water motors and the forms of owned power included under the head of "Other" showing a decrease. The more general use of gas engines is shown, the number of such engines reported being 100 in 1909, as against 63 in 1904 and 43 in 1899. The figures also show that the practice of renting power is on the increase, 7.4 per cent of the total power being rented in 1909, as against but 5.4 per cent in 1904 and 4.4 per cent in 1899. The use of electric motors for the purpose of applying the power generated within the establishments is also shown to be rapidly becoming more common, the horse-

power of such motors increasing from 1,926 in 1899 to 9,692 in 1904 and 28,433 in 1909.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 <sup>1</sup>	1909	1904	1899 <sup>1</sup>	1909	1904	1899
<b>Primary power, total</b> .....	3,074	1,463	1,545	226,740	182,608	163,619	100.0	100.0	100.0
Owned.....	1,500	1,463	1,545	210,049	172,829	146,028	92.6	94.6	95.6
Steam.....	1,104	1,095	1,170	175,293	141,591	115,735	77.3	77.5	75.3
Gas.....	109	63	43	3,300	1,247	427	1.5	0.7	0.3
Water wheels.....	290	293	332	31,376	29,181	28,171	13.8	16.0	18.3
Water motors.....	6	12	( <sup>2</sup> )	41	50	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>2</sup> )
Other.....				39	760	2,595	( <sup>3</sup> )	0.4	1.7
Rented.....	2,174	( <sup>2</sup> )	( <sup>2</sup> )	16,691	9,779	6,691	7.4	5.4	4.4
Electric.....	2,174	( <sup>2</sup> )	( <sup>2</sup> )	13,697	6,119	2,969	6.0	3.4	1.9
Other.....				2,994	3,722	3,722	1.3	2.0	2.4
Electric motors.....	3,964	570	152	42,130	15,811	4,895	100.0	100.0	100.0
Run by current generated by establishment.....	1,790	570	152	28,433	9,692	1,926	67.5	61.3	39.3
Run by rented power.....	2,174	( <sup>2</sup> )	( <sup>2</sup> )	13,697	6,119	2,969	32.5	38.7	60.7

<sup>1</sup> Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.

<sup>2</sup> Not reported.

<sup>3</sup> Less than one-tenth of 1 per cent.

**Fuel.**—Closely related to the question of kind of power employed is that of the fuel used in generating this power, or otherwise as material in the manufacturing processes. The table following shows the quantity of each kind of fuel used in 1909, by totals for all industries and for certain selected industries.

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gasoline (barrels).	Gas (1,000 feet).	Other (tons).
<b>All industries</b> .....	186,164	927,514	31,326	6,821	171,092	115,679	314
Bread and other bakery products.....	3,795	1,753	4,633	1,160	5	4,035	.....
Cotton goods, including cotton small wares.....	47,230	220,905	27	478	776	555	.....
Electrical machinery, apparatus, and supplies.....	470	16,932	30	.....	5,228	807	.....
Foundry and machine-shop products.....	17,110	33,883	10,179	563	2,202	9,698	128
Gas, illuminating and heating.....	16,900	55,600	13,161	.....	112,189	10,291	1
Gold and silver, reducing and refining, not from the ore.....	15	1,477	995	411	58	1,265	.....
Hosiery and knit goods.....	59	6,060	.....	.....	.....	.....	.....
Jewelry.....	711	3,452	175	35	20	43,539	121
Liquors, malt.....	1,341	28,618	.....	.....	.....	.....	.....
Printing and publishing.....	406	2,526	288	34	30	5,829	.....
Silk and silk goods, including throwsters.....	134	4,156	.....	.....	.....	.....	.....
Silverware and plated ware.....	665	5,494	112	.....	5,614	14,299	7
Slaughtering and meat packing.....	160	1,440	50	138	1	25	.....
Woolen, worsted, and felt goods, and wool hats.....	16,867	198,684	.....	1,108	127	.....	.....
All other industries.....	80,342	345,808	1,076	2,894	44,842	25,336	57

## SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

(With statistics for laundries and custom saw and grist mills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and value of materials and products and the number and classes of machines used in manufactures which do not appear on the general schedule. Certain data of this character for five important industries in Rhode Island are here presented.

**Textiles.**—The progress of the textile industries is indicated by the increase in the number of spindles, looms, knitting machines, and other equipment. The following table shows the number of the principal machines used in the combined industries and for each of the four branches for 1909, 1904, and 1899:

MACHINE.	Cen- sus.	Total.	Cotton goods, including cotton small wares.	Woolen, worsted, and felt goods, and wool hats.	Hosiery and knit goods.	Silk and silk goods, including throwsters.
Producing spindles.	1909 1904 1899	2,836,038 2,489,016 2,350,020	2,363,689 2,085,802 1,920,522	450,127 379,374 419,844	1,280 4,304 6,244	11,042 19,476 3,410
Looms.....	1909 1904 1899	81,093 63,830 50,838	69,330 54,021 42,298	9,252 8,103 8,007	.....	2,511 1,706 533
Knitting machines.	1909 1904 1899	1,669 1,170 1,262	.....	.....	1,669 1,170 1,262	.....
Cards (sets).....	1909 1904 1899	625 669 488	.....	621 659 478	.....	4 10 10
Combing machines.	1909 1904 1899	461 294 290	.....	461 291 287	.....	.....

The total number of producing spindles shows an increase from 1904 to 1909 of 347,022, or 13.9 per cent, the number of looms an increase of 17,263, or 27 per cent, the number of knitting machines an increase of 499, or 42.6 per cent, and the number of combing machines an increase of 167, or 56.8 per cent, while the number of sets of cards decreased 44, or 6.6 per cent. The gains for producing spindles and for looms were much greater than the gains shown for the five-year period 1899 to 1904, which were 5.9 per cent and 25.6 per cent, respectively. The cotton mills made the largest gain in absolute number of spindles, the increase being 277,887, or 13.3 per cent; this industry also reported by far the largest number of spindles, 2,363,689. About one-fifth as many spindles were used in the woolen and worsted mills, and the increase was 79,753, or 21 per cent. The knitting mills and the silk mills each used fewer spindles in 1909 than in 1904. The number of looms used in the cotton mills increased 15,309, or 28.3 per cent; in the woolen mills 1,149, or 14.2 per cent; and in the silk mills 805, or 47.2 per cent.

**Woolen and worsted goods.**<sup>1</sup>—This industry in the state, which consists exclusively of the manufacture of woolen

<sup>1</sup> The title of this industry in the tables, being uniform for all states, is "woolen, worsted, and felt goods, and wool hats," but in Rhode Island only woolen and worsted goods are made.

and of worsted goods, dates from 1804, when the first woolen mill was started at Peacedale. It ranks first among the manufacturing industries of the state both in cost of materials and in value of products, and second in value added by manufacture.

The quantity and cost of the materials reported for this industry in 1909, 1904, and 1899, by kinds, are given in the next table.

KIND.	1909	1904	1899
<b>Materials used, total cost.....</b>	<b>\$51,025,376</b>	<b>\$35,936,232</b>	<b>\$24,877,585</b>
<b>Wool:</b>			
Foreign (in condition purchased)--- Pounds.....	20,973,809	9,293,080	9,842,343
Cost.....	\$7,300,286	\$3,103,045	\$2,894,387
Domestic (in condition purchased)--- Pounds.....	58,108,445	56,776,065	41,014,744
Cost.....	\$15,408,437	\$13,804,403	\$8,333,765
<b>Cotton:</b>			
Pounds.....	579,139	1,847,509	3,535,334
Cost.....	\$90,882	\$200,491	\$360,241
<b>Shoddy:</b>			
Pounds.....	1,546,404	4,273,269	2,101,252
Cost.....	\$250,820	\$631,450	\$309,287
<b>Wool or other waste and noils:</b>			
Pounds.....	2,578,085	3,160,612	2,005,717
Cost.....	\$830,380	\$880,816	\$588,704
<b>Tops purchased:</b>			
Pounds.....	10,406,834	4,150,072	2,874,537
Cost.....	\$7,887,543	\$2,455,639	\$1,499,364
<b>Yarn purchased:</b>			
<b>Woolen—</b>			
Pounds.....	273,926	1,233,801	1,174,278
Cost.....	\$143,015	\$715,529	\$582,961
<b>Worsted—</b>			
Pounds.....	13,403,194	10,382,578	7,794,620
Cost.....	\$11,987,111	\$8,009,611	\$5,726,002
<b>Merino—</b>			
Pounds.....	65,430	405,642	115,000
Cost.....	\$32,437	\$139,020	\$53,570
<b>Cotton—</b>			
Pounds.....	5,479,701	5,596,723	4,174,100
Cost.....	\$1,530,130	\$1,391,502	\$941,494
<b>Silk—</b>			
Pounds.....	27,191	80,330	18,688
Cost.....	\$150,824	\$342,337	\$82,040
<b>Spun silk—</b>			
Pounds.....	18,376	57,119	25,220
Cost.....	\$71,649	\$231,227	\$88,336
<b>Chemicals and dyestuffs.....</b>	<b>\$1,536,824</b>	<b>\$1,108,222</b>	<b>\$1,019,008</b>
<b>Fuel and rent of power.....</b>	<b>906,926</b>	<b>740,479</b>	<b>435,837</b>
<b>All other materials.....</b>	<b>2,814,094</b>	<b>2,032,374</b>	<b>1,002,467</b>

Both the quantity and the cost of the foreign wool used more than doubled from 1904 to 1909, while from 1899 to 1904 there was a decrease of 549,263 pounds in quantity, although there was an increase of \$208,658 in cost. Of all wool consumed in 1909, 73.5 per cent was domestic, representing 67.9 per cent of the total cost of this material, while in 1904 the proportions were 85.9 per cent and 81.6 per cent, respectively. A decrease is shown in the quantity and cost of the cotton consumed. The most conspicuous gains shown for any materials not made in the mill were for tops and for worsted yarns. For tops increases of 6,256,762 pounds in quantity and \$5,431,904 in cost were reported, and for worsted yarns increases of 3,020,616 pounds in quantity and \$3,917,500 in cost. Shoddy, wool and other waste and noils, and woolen, merino, silk, and spun silk yarns all show decreases in quantity and cost, but cotton yarn shows a decrease in quantity only.

The statement following compares the quantity and value reported for the different kinds of products at the last three censuses.

KIND.	1909	1904	1899
<b>Products, total value</b> .....	<b>\$74,600,940</b>	<b>\$52,040,763</b>	<b>\$38,671,879</b>
All wool woven goods, whether woolen or worsted:			
Wool cloth, etc.—			
Square yards.....	4,716,866	4,555,010	1,735,526
Value.....	\$3,436,215	\$2,654,026	\$1,308,525
Worsted coatings, etc.—			
Square yards.....	30,517,666	18,703,540	16,620,693
Value.....	\$24,280,705	\$16,802,566	\$12,584,043
Woolen overcoatings, etc.—			
Square yards.....	178,227	592,199	810,804
Value.....	\$120,488	\$504,400	\$829,714
Worsted dress goods, cashmeres, bunnings, etc.—			
Square yards.....	18,069,251	18,276,957	9,850,120
Value.....	\$8,096,724	\$7,198,495	\$4,059,947
All other—			
Square yards.....	179,581	1,613,530	1,671,829
Value.....	\$121,728	\$1,057,071	\$1,239,145
Union or cotton mixed woven goods:			
Unions, tweeds, etc.—			
Square yards.....	1,831,640	3,708,784	1,244,332
Value.....	\$984,481	\$2,138,727	\$835,901
All other—			
Square yards.....	164,500	321,656	555,869
Value.....	\$60,225	\$142,590	\$482,790
Goods woven on cotton warps, etc.:			
Worsted filling, cassimeres, jeans, etc.—			
Square yards.....	8,453,778	6,772,247	6,738,436
Value.....	\$5,030,340	\$3,955,123	\$4,585,717
Worsted filling, dress goods, etc.—			
Square yards.....	7,187,938	2,995,144	8,835,833
Value.....	\$2,276,346	\$930,799	\$1,620,473
All other—			
Square yards.....	5,140,513	2,292,029	2,095,579
Value.....	\$2,303,847	\$870,381	\$599,191
Upholstery goods and sundries.....	\$220,661	\$619,409	\$382,000
Partly manufactured goods for sale:			
Woolen yarn, all wool—			
Pounds.....	661,234	1,339,608	570,528
Value.....	\$368,165	\$844,691	\$258,419
Woolen yarn, union or merino—			
Pounds.....	534,654	2,341,087	1,187,630
Value.....	\$225,317	\$1,150,011	\$684,011
Worsted yarn and tops—			
Pounds.....	24,285,265	13,222,913	8,789,306
Value.....	\$23,410,014	\$10,551,023	\$6,789,859
Noils—			
Pounds.....	5,199,661	3,319,117	2,099,777
Value.....	\$1,819,094	\$1,240,806	\$661,720
Waste—			
Pounds.....	7,106,426	5,837,000	3,292,631
Value.....	\$1,316,779	\$831,452	\$410,317
All other—			
Pounds.....	177,701	1,461,544	708,836
Value.....	\$32,248	\$820,589	\$454,555
Amount received for contract work.....	\$366,622	\$138,822	\$149,026
All other products.....	\$122,251	\$282,882	\$745,026

The quantity of all kinds of wool woven goods reported, whether woolen or worsted, was 53,661,591 square yards in 1909, as compared with 43,831,236 in 1904 and 30,698,062 in 1899, a gain of 9,830,355 square yards in 1909 as compared with 1904, and of 13,133,174 square yards in 1904 as compared with 1899. In 1909, compared with 1904, decided increases were made in each of the three classes of goods woven on cotton warps, the most noteworthy being in those included under the head "All other," which more than doubled. Both classes of union or cotton mixed goods decreased in both quantity and value. Partly manufactured goods, such as yarns, noils, waste, etc., generally increased in quantity and value, although all wool yarns and those included under the head "All other" both decreased. The out-

put of worsted yarn and tops increased 11,062,352 pounds, and the value of the output \$12,858,991.

Cotton goods, including cotton small wares.—The beginning of the cotton industry in the United States under the factory system took place in Rhode Island with the starting of the first mill at Pawtucket in 1790. This was a water frame cotton mill producing cotton warp, which was used by hand weavers in the production of sheetings, shirtings, checks, and ginghams. With the introduction in 1814 of power looms and dressing machines simultaneously in Providence, R. I., and in Waltham, Mass., a single establishment was enabled to perform all the processes of cotton manufacture. The industry in the state has shown a healthy growth.

The quantity and cost of the materials used, by kinds, in 1909, 1904, and 1899, are given below:

KIND.	1909	1904	1899
<b>Materials used, total cost</b> .....	<b>\$25,401,239</b>	<b>\$19,065,504</b>	<b>\$11,697,461</b>
Cotton:			
Domestic—			
Pounds.....	101,866,174	80,422,995	92,900,390
Cost.....	\$13,138,735	\$11,021,798	\$6,794,160
Egyptian and other foreign—			
Pounds.....	10,800,853	6,125,640	6,575,088
Cost.....	\$2,030,857	\$1,023,838	\$592,179
Yarn purchased:			
Cotton—			
Pounds.....	13,263,003	13,033,803	7,031,251
Cost.....	\$4,051,301	\$3,363,127	\$1,440,361
Silk and spun silk—			
Pounds.....	516,323	(1)	(1)
Cost.....	\$1,278,828	(1)	(1)
Other—			
Pounds.....	112,904	(1)	(1)
Cost.....	\$115,502	\$151,719	\$104,195
Cotton waste purchased:			
Pounds.....	20,195,998	45,168,838	5,993,702
Cost.....	\$1,274,989	\$1,824,505	\$269,853
Starch:			
Pounds.....	3,584,542	2,778,192	2,487,648
Cost.....	\$116,461	\$85,137	\$70,707
Chemicals and dyestuffs.....	\$237,997	\$149,399	\$371,706
Fuel and rent of power.....	1,045,147	796,652	568,946
All other materials.....	2,061,422	1,309,419	1,485,354

<sup>1</sup> Not reported separately.

The cotton consumed in this industry in 1909 amounted to 112,757,027 pounds, which cost \$15,169,592, representing an increase since 1904 of 17,208,392 pounds, or 18 per cent, in quantity, and of \$3,123,956, or 25.9 per cent, in cost. In 1909 the quantity and cost of domestic cotton represented 90.4 per cent and 86.6 per cent of the respective totals for all cotton consumed, proportions somewhat smaller than the corresponding figures for 1904, which were 93.6 per cent and 91.5 per cent, respectively. There was a slight gain in the quantity of cotton yarn purchased, whereas its cost increased \$748,174. The waste purchased from other mills decreased decidedly, 15,972,840 pounds in quantity and \$549,516 in cost.

The statement following shows the products reported for the industry at the last three censuses.

KIND.	1909	1904	1899
Products, total value.....	\$50,312,597	\$34,573,450	\$26,435,675
Plain cloths for printing or converting:			
Square yards.....	111,665,838	93,355,183	99,272,574
Value.....	\$8,008,079	\$4,345,901	\$4,354,811
Brown or bleached sheetings or shirtings:			
Square yards.....	135,165,530	90,133,798	128,276,782
Value.....	\$10,204,180	\$5,576,734	\$7,160,965
Twills and satens:			
Square yards.....	53,871,659	56,095,899	43,308,277
Value.....	\$4,139,572	\$3,880,069	\$2,504,620
Fancy woven fabrics:			
Square yards.....	49,309,098	51,009,823	21,554,243
Value.....	\$7,108,484	\$4,242,956	\$1,907,352
Corduroy, cotton velvet, and plush:			
Square yards.....	3,106,639	3,422,296	1,905,422
Value.....	\$1,135,767	\$940,030	\$779,900
Tapes and webbing:			
Pounds.....	3,791,553		
Value.....	\$2,214,178	\$1,531,909	\$978,249
Yarns, for sale:			
Pounds.....	19,752,020	16,462,391	14,482,710
Value.....	\$6,666,271	\$4,954,670	\$2,845,261
Thread:			
Pounds.....	3,715,469	2,934,660	3,943,840
Value.....	\$3,516,713	\$2,717,267	\$2,734,280
Cotton waste, not used for further manufacture:			
Pounds.....	42,158,042	40,352,389	19,169,895
Value.....	\$1,984,192	\$2,177,008	\$393,079
All other products.....	\$5,335,211	\$4,207,006	\$2,087,158

Brown or bleached sheetings and shirtings showed the greatest value in 1909 as in 1904, and during the five-year period the quantity made increased 45,031,732 square yards and its value \$4,627,446. The quantity of plain cloth for printing or converting manufactured increased by 18,310,655 square yards, and its value by \$3,662,178; while the quantity of fancy woven fabrics decreased by 1,700,730 square yards, although their value increased by \$2,865,478. It is significant that the quantities of the different classes of products did not increase as much proportionally as their values, which is due principally to the general rise in prices and in part perhaps to the manufacture of a higher grade fabric in 1909 than in 1904.

Silk and silk goods, including throwsters.—The third industry in importance among the textile industries of Rhode Island in respect to value of products is the manufacture of silk and silk goods. The first silk mill reported in the state was at the census of 1879. The recent development of this branch of the textile industries has been more rapid than in the case of any other of the textile group. In value of products it has displaced hosiery and knit goods in rank since 1904.

The statement following compares the kind, quantity, and value of the materials consumed in the industry as reported at the last three censuses.

The relative increase in the use of raw silk from census to census is the most noteworthy feature of this table. There has been an increase of 221,218 pounds in the quantity of this class of material reported and of \$994,011 in its cost since 1904. While there has been far more cotton than woolen or worsted yarn used, the increase in the use of the latter material has been proportionally greater than that in the use of the former.

A detailed statement of products can not be shown without disclosing the operations of individual establishments. The principal product, however, consisted

of silk-mixed, piece-dyed broad silks. In 1909 no silk was thrown for other establishments under contract, while in 1904 a total of 88,000 pounds was thrown—68,000 pounds into organzine and 20,000 pounds into tram.

KIND.	1909	1904	1899
Materials used, total cost.....	\$3,187,685	\$1,695,950	\$818,561
Silk:			
Raw—			
Pounds.....	483,330	262,112	102,691
Cost.....	\$2,173,458	\$1,179,447	\$490,750
Spun—			
Pounds.....	73,816	52,145	51,516
Cost.....	\$175,113	\$139,909	\$136,404
Yarns, not made in mill:			
Woolen or worsted—			
Pounds.....	59,811	7,800	2,667
Cost.....	\$93,493	\$6,040	\$2,000
Cotton—			
Pounds.....	1,421,229	969,426	409,936
Cost.....	\$404,141	\$290,214	\$122,800
Fuel and rent of power.....	\$36,001	\$20,341	\$6,176
All other materials.....	305,389	59,999	60,431

Hosiery and knit goods.—This industry has been carried on in the state at least since 1870, when three mills were in operation. Its real growth, however, began in 1889. While it is the least important of the textile group in respect to value of products, the gains have been substantial from year to year.

The following statement compares the quantity and cost of the different kinds of materials used in 1909, 1904, and 1899:

KIND.	1909	1904	1899
Materials used, total cost.....	\$2,444,457	\$2,271,099	\$1,770,979
Yarns, not made in mill:			
Worsted—			
Pounds.....	597,037	622,209	531,778
Cost.....	\$686,017	\$606,595	\$488,442
Merino—			
Pounds.....	314,648	120,331	8,989
Cost.....	\$446,544	\$56,779	\$5,450
Cotton—			
Pounds.....	4,009,892	4,778,112	4,071,297
Cost.....	\$1,220,424	\$1,154,834	\$809,552
Silk and spun silk—			
Pounds.....	22,900	5,425	155
Cost.....	\$41,955	\$17,352	\$432
Chemicals and dyestuffs.....	\$32,160	\$61,935	\$14,791
Fuel and rent of power.....	29,795	42,082	25,715
All other materials.....	214,592	331,522	426,594

<sup>1</sup> Does not include the operations of one establishment engaged in the manufacture of hand knit goods.

A conspicuous feature in the development of this industry is the marked decrease during the last decade in the quantity of raw cotton and wool consumed. In 1899, 735,548 pounds of wool and 125,733 pounds of cotton were used. In 1904 the quantity of wool had decreased to 559,124 pounds and the quantity of cotton to 47,000 pounds, while in 1909 only one establishment spun a portion of the yarn knitted. The material reported for 1909 consists mostly of yarn spun in other mills. Cotton yarn was the principal material used, the cost of which formed about one-half of the total cost of all materials at each of the three censuses. From 1904 to 1909 decreases are shown in the amounts of worsted and cotton yarns consumed, while increases are reported in the case of merino yarns and of silk and spun-silk yarns.

The kind, quantity, and value of products at the last three censuses were as follows:

KIND.	1909	1904	1899
Products, total value.....	\$3,865,792	\$3,344,655	\$2,724,825
Hose:			
Dozens.....	<sup>2</sup> 428,551	338,754	216,855
Value.....	<sup>2</sup> \$1,024,802	\$763,963	\$507,498
Half hose:			
Dozens.....	125,643	41,063	55,412
Value.....	\$220,280	\$80,000	\$98,223
Shirts and drawers:			
Dozens.....	199,997	212,307	133,486
Value.....	\$830,977	\$650,540	\$447,085
Combination suits:			
Dozens.....	111,199	1,950	6,800
Value.....	\$554,201	\$16,000	\$28,440
Boot and shoe linings:			
Square yards.....	6,686,112	9,021,062	5,151,255
Value.....	\$802,000	\$820,362	\$826,851
All other products.....	\$373,442	\$1,001,790	\$816,728

<sup>1</sup> Does not include the operations of one establishment engaged in the manufacture of hand knit goods.  
<sup>2</sup> Includes silk hose and half hose.

From 1904 to 1909 there was a general increase in the value of each kind of product, with the exception of those included under the head "All other products." During the five-year period 1899 to 1904, on the other hand, small decreases were reported in the value of half hose, combination suits, and boot and shoe linings, although large increases were shown for all other classes of products. The quantities generally increased from 1899 to 1904, but from 1904 to 1909 there was a decrease of 12,310 dozen in the output of shirts and drawers and of 2,334,950 square yards in the output of boot and shoe linings. The greatest gains were those made in the output of combination suits, which more than counterbalance the loss in shirts and drawers. The decided decline in the value of "All other products" from \$1,001,790 in 1904 to \$373,442 in 1909, was due principally to the discontinuance of the manufacture of eiderdown.

**Printing and publishing.**—Though the printing and publishing industry as a whole in Rhode Island shows considerable growth during the last five years as measured by the financial statistics, the number of publications and aggregate circulation have decidedly decreased during the same period, as shown by the table following.

Without exception each of the different classes of publications shows a decrease in number in 1909 as compared with 1904, the greatest decline being in the weeklies. Only for the publications included under

the head "All other classes" is a gain shown in circulation. The wider circulation of the Boston newspapers and periodicals possibly may have had some effect upon the circulation of home papers. In 1909, three of the twelve daily papers, with an aggregate circulation of 30,608, were morning editions. All the publications were in the English language except one daily, which was in French; three weeklies, two of which were in Italian and one in German; and one semiweekly, which was in French.

PERIOD OF ISSUE.	NUMBER OF PUBLICATIONS.			AGGREGATE CIRCULATION PER ISSUE.		
	1909	1904	1899	1909	1904	1899
Total.....	47	60	43	254,493	280,213	170,594
Daily.....	12	13	12	147,045	163,056	118,844
Sunday.....	2	3	2	44,625	49,408	( <sup>1</sup> )
Semiweekly.....	3	4	2	6,810	6,719	6,854
Weekly.....	21	29	21	34,013	39,542	37,671
All other classes.....	9	11	3	23,000	20,888	7,225

<sup>1</sup> Included in circulation for daily.    <sup>2</sup> Includes one triweekly publication.

**Laundries.**—Statistics for steam laundries are not included in the general tables. There were 53 such establishments in the state of Rhode Island, 24 of which were in Providence, 8 in Warwick, 5 in Newport, 5 in Pawtucket, and 5 in Woonsocket. The following statement summarizes the statistics:

Number of establishments.....	53
Persons engaged in the industry.....	1,211
Proprietors and firm members.....	70
Salaried employees.....	65
Wage earners (average number).....	1,076
Primary horsepower.....	1,368
Capital.....	\$612,524
Expenses.....	841,748
Services.....	523,045
Materials.....	158,443
Miscellaneous.....	160,260
Amount received for work done.....	1,019,404

The most common form of organization was the individual, with 28 establishments. The firm and corporate forms of ownership were represented by 20 and 5 establishments, respectively. Thirteen establishments had receipts for the year's business of less than \$5,000; 27, \$5,000 but less than \$20,000; 11, \$20,000 but less than \$100,000; and 2, \$100,000 but less than \$1,000,000.

## STATISTICS OF MANUFACTURES—RHODE ISLAND.

The number of wage earners employed each month and the per cent which this number represented of the greatest number employed in any month were as follows:

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	1,031	94.2	July.....	1,105	100.0
February.....	1,040	94.1	August.....	1,101	99.6
March.....	1,041	94.2	September.....	1,104	100.0
April.....	1,047	94.8	October.....	1,091	98.7
May.....	1,070	96.8	November.....	1,095	99.1
June.....	1,083	98.0	December.....	1,095	99.1

The different kinds of primary power, the number of engines, and the amount of horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines.	Horsepower.
<b>Primary power, total</b> .....		1,368
Owned.....	54	1,275
Steam.....	52	1,252
Gas.....	2	23
Rented.....		93
Electric.....	3	20
Other.....		73

The kind and amount of fuel used are shown in the following statement:

KIND.	Unit.	Quantity.
Anthracite coal.....	Tons.....	1,000
Bituminous coal.....	Tons.....	8,081
Coke.....	Tons.....	50
Wood.....	Cords.....	74
Oil.....	Barrels.....	25
Gas.....	1,000 feet.....	2,027

Custom saw and grist mills.—Statistics for custom saw and grist mills are not included in the general tables, but are presented in the following summary:

	Custom sawmills.	Custom gristmills.
Number of establishments.....	11	15
Persons engaged in industry.....	28	16
Proprietors and firm members.....	12	16
Salaried employees.....		
Wage earners (average number).....	14	
Primary horsepower.....	410	463
Capital.....	\$19,500	\$27,805
Expenses.....	11,110	36,843
Services.....	7,191	
Materials.....	807	135,875
Miscellaneous.....	3,112	977
Value of products.....	15,200	45,666

<sup>1</sup>Includes estimated cost of grain ground.

STATISTICS OF MANUFACTURES—RHODE ISLAND.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.  
THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Subsidiary employees.	Wage earners (average number).							
<b>STATE—All industries.....</b>	1909	1,951	122,041	1,721	7,982	113,588	220,740	\$290,801	\$10,577	\$55,234	\$158,102	\$280,944	\$122,152
	1904	1,617	104,289	1,561	6,420	97,318	183,608	215,901	7,041	42,113	112,872	202,110	89,238
	1899	1,678	( <sup>1</sup> )	( <sup>1</sup> )	4,022	88,197	153,619	176,902	5,301	35,955	87,652	165,550	77,598
Brass and bronze products.....	1909	18	257	15	17	225	350	500	25	118	549	828	270
	1904	<sup>2</sup> 26	304	31	32	301	220	432	33	141	342	608	326
	1899	20	244	24	13	207	( <sup>1</sup> )	229	13	72	211	431	220
Bread and other bakery products.....	1909	187	1,401	213	133	1,055	757	1,436	83	650	2,471	3,037	1,406
	1904	174	1,228	205	59	964	308	1,056	43	570	1,824	3,054	1,230
	1899	170	1,070	200	164	706	( <sup>1</sup> )	640	85	352	1,230	2,156	920
Copper, tin, and sheet-iron products.....	1909	41	470	44	49	377	170	548	58	218	452	932	480
	1904	<sup>2</sup> 21	381	17	50	314	159	391	42	165	351	736	355
	1899	<sup>2</sup> 17	( <sup>1</sup> )	( <sup>1</sup> )	18	194	( <sup>1</sup> )	230	15	98	152	360	208
Cotton goods, including cotton small wares.....	1909	100	20,488	46	650	28,786	95,278	67,679	1,330	11,707	25,401	50,313	24,012
	1904	99	25,425	50	611	24,758	75,607	47,477	1,021	8,500	19,666	34,573	14,007
	1899	87	24,440	28	380	24,032	67,309	40,151	734	8,033	11,697	26,436	14,789
Electrical machinery, apparatus, and supplies..	1909	12	1,730	5	124	1,601	2,837	4,315	179	678	4,505	6,410	1,815
	1904	11	1,531	3	119	1,400	3,223	3,008	153	557	4,017	5,435	1,418
	1899	13	922	8	50	504	1,388	2,652	65	320	4,135	5,113	978
Enameling and japanning.....	1909	21	673	27	31	615	337	210	22	271	140	570	424
	1904	11	420	17	18	385	103	103	16	158	62	338	276
	1899	20	430	28	14	388	( <sup>1</sup> )	108	13	117	63	265	202
Flour-mill and gristmill products.....	1909	18	68	18	11	39	1,046	387	11	22	700	886	60
	1904	22	83	23	15	45	1,310	389	7	24	1,050	1,134	75
	1899	21	( <sup>1</sup> )	( <sup>1</sup> )	19	92	( <sup>1</sup> )	481	14	35	1,563	1,820	257
Foundry and machine-shop products.....	1909	141	11,005	87	881	10,937	11,033	27,101	1,203	6,000	8,014	20,612	12,598
	1904	143	9,498	105	770	8,017	8,308	23,883	1,077	4,676	5,014	14,104	9,180
	1899	165	( <sup>1</sup> )	( <sup>1</sup> )	523	8,940	( <sup>1</sup> )	16,751	720	4,705	5,573	13,562	8,019
Gas, illuminating and heating.....	1909	8	487	.....	75	412	719	7,110	118	303	530	1,833	1,303
	1904	6	524	.....	62	462	652	5,793	80	303	562	1,580	1,078
	1899	6	475	.....	45	430	353	5,004	50	240	244	960	725
Gold and silver, reducing and refining, not from the ore.	1909	15	142	15	45	82	270	711	70	57	4,171	4,442	271
	1904	10	120	16	27	77	225	500	29	55	3,087	4,261	274
	1899	10	108	16	22	70	( <sup>1</sup> )	500	24	44	3,138	3,484	346
Hosiery and knit goods.....	1909	17	1,849	9	66	1,774	1,626	2,878	147	685	2,444	3,866	1,422
	1904	<sup>2</sup> 15	1,802	9	72	1,721	1,555	2,277	100	574	2,271	3,345	1,074
	1899	18	1,675	13	60	1,590	1,231	2,454	88	470	1,771	2,725	954
Jewelry.....	1909	206	11,002	262	1,199	6,511	2,425	17,050	1,548	4,761	9,788	20,685	10,807
	1904	197	7,607	233	799	6,475	2,524	11,199	919	3,365	6,058	14,432	7,774
	1899	210	( <sup>1</sup> )	( <sup>1</sup> )	602	7,102	( <sup>1</sup> )	8,788	583	3,140	6,177	13,220	7,052
Liquors, malt.....	1909	9	543	3	60	450	2,055	4,530	102	384	1,188	3,570	2,301
	1904	7	473	1	60	406	2,031	4,771	117	330	723	2,740	2,017
	1899	6	350	1	53	296	1,967	3,338	90	224	453	1,880	1,427
Lumber and timber products.....	1909	57	850	59	73	748	2,828	1,343	83	437	1,064	1,007	843
	1904	47	761	54	49	658	2,472	1,018	46	371	850	1,008	848
	1899	51	( <sup>1</sup> )	( <sup>1</sup> )	31	637	( <sup>1</sup> )	979	29	280	616	1,247	631
Marble and stone work.....	1909	46	764	61	43	600	1,754	577	61	451	240	1,033	784
	1904	23	828	27	43	758	1,316	678	58	520	278	1,040	762
	1899	40	( <sup>1</sup> )	( <sup>1</sup> )	26	882	( <sup>1</sup> )	753	24	473	254	1,070	825
Printing and publishing.....	1909	147	2,049	139	456	1,454	1,044	3,257	493	656	1,004	3,780	2,716
	1904	140	1,998	130	434	1,432	939	2,604	364	787	816	3,070	2,254
	1899	<sup>2</sup> 119	1,499	128	124	1,247	( <sup>1</sup> )	1,750	130	683	552	2,048	1,490
Silk and silk goods, including throwsters.....	1909	13	1,750	6	59	1,685	2,318	3,496	80	788	3,188	4,584	1,300
	1904	8	1,326	4	31	1,201	1,045	2,652	41	480	1,606	2,556	860
	1899	6	466	3	8	455	250	680	12	167	819	1,311	492
Silverware and plated ware.....	1909	11	2,517	8	215	2,294	1,515	9,422	251	1,568	2,635	6,198	3,563
	1904	<sup>2</sup> 10	2,057	9	139	1,919	1,133	8,582	171	1,440	2,423	5,323	2,900
	1899	<sup>2</sup> 12	1,978	11	152	1,815	( <sup>1</sup> )	5,499	171	1,100	1,881	4,240	2,368
Slaughtering and meat packing.....	1909	21	267	26	27	214	428	593	53	122	2,794	3,156	362
	1904	16	223	22	15	186	357	562	13	105	2,384	2,657	273
	1899	<sup>2</sup> 13	278	20	27	231	( <sup>1</sup> )	770	26	123	2,204	2,506	302
Tobacco manufactures.....	1909	65	360	79	13	208	7	228	18	180	106	537	341
	1904	38	264	43	4	217	3	184	6	120	135	353	223
	1899	34	208	35	14	159	( <sup>1</sup> )	121	12	66	92	293	201
Woolen, worsted, and felt goods, and wool hats..	1909	88	25,673	26	723	24,924	43,715	68,867	1,322	11,538	51,025	74,600	23,575
	1904	82	22,090	44	430	21,610	35,981	45,600	654	9,102	35,936	52,641	16,705
	1899	<sup>2</sup> 77	18,060	62	401	17,606	28,420	41,018	737	6,641	24,878	38,572	13,794
All other industries.....	1909	614	28,306	543	2,896	25,427	53,310	68,594	3,260	12,301	35,438	65,656	30,218
	1904	511	25,388	512	1,563	23,313	42,453	51,953	2,051	10,371	21,848	46,277	24,420
	1899	563	( <sup>1</sup> )	( <sup>1</sup> )	1,270	20,248	( <sup>1</sup> )	43,316	1,657	8,608	20,153	41,505	21,442

<sup>1</sup> Figures not available.  
<sup>2</sup> Does not include statistics for one establishment, to avoid disclosure of individual operations.  
<sup>3</sup> Does not include statistics for two establishments, to avoid disclosure of individual operations.

STATISTICS OF MANUFACTURES—RHODE ISLAND.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Cen- sus.	Number of estab- lish- ments.	PERSONS ENGAGED IN INDUSTRY.				Pri- mary horse- power.	Cap- ital.	Sub- sides.	Wages.	Cost of mathe- rials.	Value of prod- ucts.	Value added by manu- facture.
			Total.	Pro- pri- ators and firm mem- bers.	Sali- ried em- ploy- ees.	Wage earn- ers (ave- rage num- ber).							
Expressed in thousands.													
<b>PAWTUCKET—All industries</b> .....	1909	217	16,381	166	820	15,275	29,510	\$40,084	\$1,405	\$7,955	\$21,540	\$37,698	\$16,158
	1904	186	12,950	169	787	12,054	(1)	27,178	1,040	5,100	14,112	26,847	11,731
	1899	181	(-)	(1)	405	10,712	(1)	20,461	715	4,331	9,977	19,372	9,293
Bread and other bakery products.....	1909	10	122	17	10	95	94	145	6	53	262	365	113
	1904	11	111	19	6	80	(1)	90	4	48	185	270	91
	1899	19	152	24	21	107	(1)	70	14	50	140	254	114
Cotton goods, including cotton small wares.....	1909	23	7,265	4	216	7,045	16,524	16,606	420	3,039	7,567	14,398	6,771
	1904	20	5,784	3	235	5,526	(1)	10,422	364	2,143	5,627	10,069	4,472
	1899	15	4,572	5	110	4,457	(1)	5,500	214	1,601	2,699	5,635	2,550
Foundry and machine-shop products.....	1909	20	1,340	7	96	1,243	1,101	2,770	153	757	841	2,250	1,409
	1904	22	1,089	15	98	1,000	(1)	2,334	99	545	719	1,852	1,153
	1899	23	1,081	23	45	1,013	(1)	1,627	67	561	855	1,833	978
Hosiery and knit goods.....	1909	5	444	4	15	425	232	710	30	141	710	980	379
	1904	3	228	(1)	11	217	(1)	307	15	65	429	559	193
	1899	3	(1)	(1)	9	235	(1)	270	8	57	334	450	125
Jewelry.....	1909	7	293	6	23	264	75	291	39	84	199	365	185
	1904	4	96	4	9	83	(1)	88	12	26	32	115	53
	1899	6	205	12	11	182	(1)	313	10	79	328	508	269
Lumber and timber products.....	1909	8	289	9	22	258	567	515	24	161	469	723	354
	1904	3	123	2	14	107	(1)	264	15	64	166	303	137
	1899	4	(1)	(1)	15	101	(1)	380	18	51	159	348	152
Printing and publishing.....	1909	12	104	13	28	123	186	322	35	80	194	368	204
	1904	13	232	16	48	168	(1)	397	46	92	120	414	234
	1899	14	(1)	(-)	26	160	(1)	329	19	80	110	316	210
Tobacco manufactures.....	1909	14	116	21	1	94	(1)	81	1	55	61	156	75
	1904	12	106	13	1	92	(1)	91	1	52	46	131	55
	1899	12	64	12	4	38	(1)	35	3	21	29	68	31
All other industries.....	1909	112	6,222	85	409	5,728	10,601	18,444	688	2,876	11,337	18,111	6,774
	1904	98	5,201	87	345	4,769	(1)	13,135	484	2,065	6,788	12,068	5,284
	1899	95	(1)	(1)	254	4,410	(1)	11,077	362	1,831	5,367	9,790	4,533
<b>PROVIDENCE—All industries</b> .....	1909	1,080	51,667	1,017	4,269	46,381	50,410	118,512	5,650	24,449	64,770	130,341	55,471
	1904	861	43,748	893	3,051	39,804	(1)	95,666	3,819	19,555	46,073	91,081	42,000
	1899	929	(1)	(1)	2,493	38,368	(1)	79,686	3,033	16,931	42,551	78,657	38,166
Brass and bronze products.....	1909	11	140	12	7	121	98	272	13	70	346	477	122
	1904	21	330	26	32	281	(1)	402	33	130	320	618	258
	1899	15	212	18	12	182	(1)	193	12	59	177	371	126
Bread and other bakery products.....	1909	87	770	103	78	598	364	884	46	302	1,473	2,381	964
	1904	83	652	100	35	514	(1)	569	39	312	1,054	1,757	733
	1899	78	564	93	107	354	(1)	292	59	175	718	1,182	419
Copper, tin, and sheet-iron products.....	1909	27	390	23	43	310	106	485	50	176	365	784	399
	1904	15	312	11	44	257	(1)	346	36	128	347	634	287
	1899	11	(1)	(1)	18	154	(1)	174	15	78	120	289	79
Cotton goods, including cotton small wares.....	1909	13	2,010	6	63	1,941	5,156	3,502	111	774	1,392	2,560	1,454
	1904	17	2,143	10	55	2,078	(1)	3,307	97	688	1,539	2,993	1,454
	1899	12	2,403	2	46	2,355	(1)	3,126	74	766	1,234	2,653	1,424
Electrical machinery, apparatus, and supplies..	1909	6	426	3	55	378	504	660	69	189	374	879	365
	1904	6	308	1	35	272	(1)	454	37	111	258	560	202
	1899	9	146	8	11	127	(1)	235	11	54	99	216	117
Foundry and machine-shop products.....	1909	85	8,404	53	543	7,708	7,298	20,150	879	4,066	5,335	14,485	9,250
	1904	80	6,179	55	576	5,548	(1)	18,030	818	3,177	3,418	6,584	3,150
	1899	97	(1)	(1)	423	6,419	(1)	12,983	589	3,433	3,665	9,737	3,792
Gold and silver, reducing and refining, not from the ore.	1909	15	142	15	45	82	270	711	20	67	4,171	4,442	734
	1904	10	120	16	27	77	(1)	590	29	55	3,087	4,281	274
	1899	10	108	16	22	70	(1)	506	24	44	3,138	3,484	267
Jewelry.....	1909	282	10,621	230	1,105	6,170	2,340	16,755	1,492	4,651	6,634	20,156	13,432
	1904	193	7,410	229	790	6,391	(1)	11,111	909	3,339	6,626	14,317	7,051
	1899	203	(1)	(1)	501	6,917	(1)	8,473	573	3,065	5,838	12,628	6,789
Liquors, malt.....	1909	4	240	(1)	47	193	858	2,414	83	168	657	1,867	1,223
	1904	4	196	(1)	29	167	(1)	2,837	60	131	368	1,427	1,061
	1899	3	142	(1)	31	111	(1)	1,768	50	81	220	1,008	748
Lumber and timber products.....	1909	17	494	12	44	348	1,081	605	53	209	430	840	457
	1904	16	300	21	32	307	(1)	537	28	182	636	896	390
	1899	15	302	23	8	271	(1)	285	7	129	265	489	214
Printing and publishing.....	1909	90	1,532	81	347	1,104	1,920	2,304	395	735	628	2,800	2,367
	1904	84	1,381	79	312	999	(1)	1,683	247	648	600	2,178	1,578
	1899	70	871	77	73	821	(1)	1,046	50	452	370	1,371	1,052

<sup>1</sup> Figures not available.

<sup>2</sup> Does not include statistics for one establishment, to avoid disclosure of individual operations.

<sup>3</sup> Does not include statistics for two establishments, to avoid disclosure of individual operations.

STATISTICS OF MANUFACTURES—RHODE ISLAND.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Cen- sus.	Num- ber of estab- lish- ments.	PERSONS ENGAGED IN INDUSTRY.				Pri- mary horse- power.	Cap- tal.	Sala- ries.	Wages.	Cost of mate- rials.	Value of prod- ucts.	Value added by manu- fac- ture.
			Total.	Pro- pri- etors and firm mem- bers.	Sala- ried em- ploy- ees.	Wage earn- ers (aver- age num- ber).							
Expressed in thousands.													
<b>PROVIDENCE—Continued.</b>													
Silverware and plated ware.....	1909	11	2,517	8	215	2,294	1,515	\$0,422	\$251	\$1,508	\$2,035	\$0,198	\$3,503
	1904	<sup>1</sup> 10	2,007	9	139	1,919	( <sup>2</sup> )	8,582	171	1,440	2,423	5,323	2,900
	1899	<sup>1</sup> 12	1,978	11	152	1,815	( <sup>2</sup> )	5,499	171	1,100	1,881	4,240	2,368
Tobacco manufactures.....	1909	38	172	42	8	122	0	115	14	91	98	280	182
	1904	16	90	17	2	71	( <sup>2</sup> )	57	4	40	60	145	85
	1899	15	109	14	0	86	( <sup>2</sup> )	58	8	24	51	168	117
Woolen, worsted, and felt goods, and wool hats.	1909	20	10,853	2	237	10,614	17,030	27,942	449	4,878	20,439	20,926	9,487
	1904	15	10,281	2	112	10,167	( <sup>2</sup> )	19,069	203	4,219	16,307	23,102	6,795
	1899	15	8,845	5	158	8,682	( <sup>2</sup> )	21,500	363	3,141	12,205	18,376	6,081
All other industries.....	1909	374	13,027	372	1,272	11,383	16,728	32,015	1,675	5,534	16,765	31,806	15,041
	1904	311	11,910	326	828	10,756	( <sup>2</sup> )	26,283	1,120	5,047	12,132	24,180	12,054
	1899	304	( <sup>1</sup> )	( <sup>2</sup> )	832	10,004	( <sup>2</sup> )	23,572	1,010	4,330	12,182	22,416	10,234

CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES COMBINED.

Central Falls.....	1909	43	2,612	26	111	2,475	4,902	\$4,075	\$145	\$1,021	\$3,381	\$5,471	\$2,090
	1904	33	2,558	30	85	2,443	( <sup>2</sup> )	4,950	123	965	3,330	5,001	1,761
	1899	36	( <sup>2</sup> )	( <sup>2</sup> )	70	2,372	( <sup>2</sup> )	3,970	104	883	2,726	4,511	1,785
Cranston.....	1909	28	1,921	16	104	1,711	3,707	5,030	232	1,003	2,887	5,625	2,738
	1904	13	650	8	61	587	( <sup>2</sup> )	1,002	86	332	506	1,039	1,043
	1899	13	( <sup>2</sup> )	( <sup>2</sup> )	45	403	( <sup>2</sup> )	1,817	69	249	613	1,402	780
Cumberland.....	1909	29	5,498	19	120	5,359	15,112	16,351	280	2,231	4,618	9,827	5,209
	1904	19	4,717	17	126	4,574	( <sup>2</sup> )	11,359	214	1,778	3,107	5,965	2,858
	1899	10	( <sup>2</sup> )	( <sup>2</sup> )	20	1,500	( <sup>2</sup> )	4,373	40	540	592	1,756	1,164
East Providence.....	1909	26	2,237	14	182	2,041	7,123	6,479	202	932	5,061	7,146	2,085
	1904	21	1,492	15	96	1,381	( <sup>2</sup> )	3,643	117	574	4,254	5,544	1,290
	1899	15	( <sup>2</sup> )	( <sup>2</sup> )	42	836	( <sup>2</sup> )	2,191	49	332	4,288	5,347	1,059
Newport.....	1909	54	800	54	110	726	869	908	82	480	570	1,379	809
	1904	46	975	46	80	849	( <sup>2</sup> )	1,286	66	489	556	1,347	791
	1899	43	( <sup>2</sup> )	( <sup>2</sup> )	50	881	( <sup>2</sup> )	1,407	48	443	654	1,575	921
Warwick.....	1909	49	6,094	55	108	6,471	22,041	13,368	322	2,803	5,394	10,589	5,195
	1904	37	6,316	44	119	6,153	( <sup>2</sup> )	8,253	187	2,144	3,848	7,052	3,204
	1899	27	( <sup>2</sup> )	( <sup>2</sup> )	67	5,465	( <sup>2</sup> )	8,318	116	1,826	2,441	0,020	3,570
Woonsocket.....	1909	130	11,341	96	542	10,703	23,571	27,700	768	4,908	10,762	28,219	11,457
	1904	103	9,112	83	357	8,672	( <sup>2</sup> )	15,462	459	3,550	10,579	19,261	8,082
	1899	104	( <sup>2</sup> )	( <sup>2</sup> )	193	7,591	( <sup>2</sup> )	13,954	256	2,854	7,100	14,745	7,576

<sup>1</sup> Does not include statistics for one establishment, to avoid disclosure of individual operations.  
<sup>2</sup> Figures not available.  
<sup>3</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the cities.

STATISTICS OF MANUFACTURES—RHODE ISLAND.

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.				Primary horse-power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Average number.	Wage earners.		Total.	16 and over.		Under 16.			
					Male.	Female.		Number.			Male.	Female.	Male.	Female.		
								Maximum month.	Minimum month.							
1 All industries.....	1,951	122,041	1,721	2,388	3,397	1,857	113,538	De 119,191	Ja 108,773	20	20	20	20	220,740		
2 Artificial stone.....	5	23	5	3	3	3	15	Je 22	Ja 10	20	20			45		
3 Belting and hose, leather.....	4	52	3	5	8	3	36	Se 39	Ja 32	36	36			297		
4 Blacking and cleansing and polishing preparations.....	5	21	4	3	4	4	10	My <sup>1</sup> 13	Ja <sup>1</sup> 7	8	6	2		5		
5 Boots and shoes, including out stock and findings.....	6	81	6	2	6	2	65	Do 79	Ja 53	79	47	32		106		
6 Boxes, fancy and paper.....	9	542	10	19	7	10	496	Do 565	Je 444	565	135	402	2	26	128	
7 Brass and bronze products.....	18	257	15	10	2	5	225	De 248	Jy <sup>1</sup> 216	247	247	243	4		350	
8 Bread and other bakery products.....	187	1,401	213	27	33	73	1,055	De 1,037	Fe 1,025	1,204	1,012	84	7	1	757	
9 Brooms.....	4	16	4				12	No <sup>1</sup> 16	Au <sup>1</sup> 10	16	16				13	
10 Brushes.....	9	150	7	3	2	1	143	De 154	My 135	154	53	98	1	2	64	
11 Carpets, rag.....	3	28	3	1		1	23	Jy 28	Do 17	17	14	3			31	
12 Carriages and wagons and materials.....	40	296	39	10	2	7	238	Mh 262	Ja 214	220	217	1	2		387	
13 Clothing, men's, including shirts.....	4	146	5	4	7	8	122	Oc 129	Au 110	127	26	101			21	
14 Confectionery.....	20	193	21	11	17	13	131	De <sup>1</sup> 143	My 122	143	80	49	2	12	160	
15 Copper, tin, and sheet-iron products.....	41	470	44	26	18	5	377	Oc 433	Ap 337	420	381	44	1	3	179	
16 Cordage and twine, jute and linen goods.....	6	156	8	5	3	1	139	Mh <sup>1</sup> 165	Au 103	160	90	64		0	477	
17 Cotton goods, including cotton small wares.....	106	20,488	46	279	262	115	28,786	De 29,192	Au 28,342	29,786	15,091	12,894	900	901	95,278	
18 Cutlery and tools, not elsewhere specified.....	17	178	23	6	1	4	144	Do 170	Jy 130	170	164	2	4		96	
19 Electrical machinery, apparatus, and supplies.....	12	1,730	5	34	45	45	1,400	Do 1,796	Jy 1,497	1,706	1,055	702	7	32	2,837	
20 Electroplating.....	19	196	22	7	0	5	156	No 168	Je <sup>1</sup> 148	167	142	19	5	1	135	
21 Enameling and japanning.....	21	673	27	7	8	16	615	Oc 714	Fe 503	680	443	221	13	3	337	
22 Fancy articles, not elsewhere specified.....	13	148	17	0	6	5	114	Do 142	Ja 99	144	103	33	2	0	40	
23 Flour-mill and gristmill products.....	18	68	18	4	6	1	39	No <sup>1</sup> 44	Mh 35	42	42				1,046	
24 Foundry and machine-shop products.....	141	11,905	87	324	376	181	10,637	Do 12,678	Ja 9,301	12,906	12,561	206	122	17	11,033	
25 Furnishing goods, men's.....	9	723	4	10	15	10	684	Mh 767	Jy 604	664	249	384	13	18	617	
26 Furniture, including refrigerators.....	10	205	11	3	4	6	181	Je 222	Fe 163	185	167	12	6		89	
27 Gas and electric fixtures and lamps and reflectors.....	5	84	7	3	2	3	69	Do 73	Ja 64	73	39	32		2	70	
28 Gas, illuminating and heating.....	8	487		21	43	11	412	Au 445	Fe 369	403	387	16			719	
29 Gold and silver, reducing and refining, not from the ore.....	15	142	15	22	16	7	82	Ja 90	Ap <sup>1</sup> 78	80	80				270	
30 Hand stamps and stencils and brands.....	5	24	9			1	14	Ja <sup>1</sup> 15	Au <sup>1</sup> 14	14	12		2		1	
31 Hats and caps, other than felt, straw, and wool.....	5	40	11	1	4	2	28	Do 31	Fe <sup>1</sup> 24	31	23	8			4	
32 Hosiery and knit goods.....	17	1,849	9	28	18	20	1,774	De 1,825	Au 1,711	1,880	374	1,374	9	123	1,626	
33 Ice, manufactured.....	5	23	2	3	1	1	17	Jy 35	Ja <sup>2</sup> 0	25	25				349	
34 Jewelry.....	296	11,002	202	337	487	375	9,511	Do 11,238	Ap 8,439	11,314	6,428	4,593	154	139	2,425	
35 Lapidary work.....	3	31	5	3	5	6	18	No <sup>1</sup> 30	Ap 10	30	29	1			7	
36 Leather goods.....	9	178	9	9	7	6	147	No 155	My 139	152	131	19	2		108	
37 Liquors, malt.....	9	543	3	25	62	3	450	Se 487	Fe 425	460	460				2,053	
38 Lumber and timber products.....	57	880	59	31	30	12	748	Ap 834	Ja 673	806	803	2	1		2,828	
39 Marble and stone work.....	40	704	61	18	21	4	660	Jy <sup>1</sup> 732	De 533	576	576				1,754	
40 Mattresses and spring beds.....	6	74	6	1	8	4	55	Je <sup>1</sup> 67	Ja 39	47	33	14			26	
41 Millinery and lace goods.....	8	280	6	5		5	265	Oc 290	Ja 228	284	17	252	1	14	56	
42 Models and patterns, not including paper patterns.....	9	67	10			1	56	Se 64	Ap 46	60	60				39	
43 Paint and varnish.....	5	65	6	7	9	0	37	No 43	Mh <sup>1</sup> 33	39	37				269	
44 Paper goods, not elsewhere specified.....	10	347	0	18	4	17	302	De 319	Ja 286	319	218	71	17	13	981	
45 Patent medicines and compounds and druggists' preparations.....	19	135	14	14	16	35	66	No 66	Jy <sup>1</sup> 52	63	37	22	3	1	23	
46 Photo-engraving.....	4	47	4	1	4	4	34	Do 37	Ap <sup>1</sup> 30	37	37				15	
47 Printing and publishing.....	147	2,049	139	91	271	94	1,454	De 1,570	Ja 1,411	1,570	1,112	421	36	1	1,944	
48 Rubber goods, not elsewhere specified.....	5	835	1	15	22	23	774	No 819	Au 745	805	391	307	21	26	1,075	
49 Shipbuilding, including boat building.....	13	596	12	7	46	2	535	My 677	Se 407	551	511	10			1,030	
50 Silk and silk goods, including throwsters.....	13	1,750	6	31	10	18	1,685	No 1,908	Ja 1,452	1,893	825	1,007	13	48	2,318	
51 Silverware and plated ware.....	11	2,517	8	28	141	46	2,194	Oc 2,473	Ja 2,078	2,393	2,130	221	25	17	1,515	
52 Slaughtering and meat packing.....	21	267	20	7	14	6	214	Do 230	Jy <sup>1</sup> 204	230	227		3		428	
53 Surgical appliances and artificial limbs.....	3	31	1	5		2	23	De <sup>1</sup> 23	Je <sup>1</sup> 22	23	16	7			52	
54 Tobacco manufactures.....	65	360	79	7	5	1	268	Se <sup>1</sup> 283	Ap 229	291	218	72		1	7	
55 Woolen, worsted, and felt goods, and wool hats.....	88	25,673	26	330	311	82	24,924	Se 25,604	Ja 24,072	24,730	12,879	10,317	726	817	43,715	
56 All other industries <sup>2</sup> .....	317	22,343	243	514	951	347	20,288								48,549	

<sup>1</sup> Same number reported for one or more other months.

<sup>2</sup> None reported for one or more other months.

<sup>3</sup> All other industries embrace—

Artists' materials.....	1	Cash registers and calculating machines.....	1	Fireworks.....	1
Automobiles, including bodies and parts.....	2	Chemicals.....	3	Flags, banners, regalia, society badges, and emblems.....	3
Awnings, tents, and sails.....	5	Clocks and watches, including cases and materials.....	1	Flavoring extracts.....	9
Bags, other than paper.....	1	Clothing, women's.....	4	Food preparations.....	5
Baking powders and yeast.....	1	Coffee and spice, roasting and grinding.....	3	Fur goods.....	1
Baskets, and rattan and willow ware.....	1	Coffins, burial cases, and undertakers' goods.....	1	Glass, cutting, staining, and ornamenting.....	3
Boots and shoes, rubber.....	3	Cooperage and wooden goods, not elsewhere specified.....	2	Gold and silver, leaf and foil.....	1
Brick and tile.....	2	Cordials and sirups.....	1	Greases and tallow.....	5
Butter.....	1	Cork cutting.....	1	Haircloth.....	3
Buttons.....	1	Dyeing and finishing textiles.....	45	Hairwork.....	1
Canning and preserving.....	2	Dyestuffs and extracts.....	10	Hat and cap materials.....	1
Card cutting and designing.....	2	Emery and other abrasive wheels.....	38	Hats, felt.....	2
Cars and general shop construction and repairs by steam-railroad companies.....	1	Engraving and diesinking.....	3	Housse furnishing goods, not elsewhere specified.....	3
Cars and general shop construction and repairs by street-railroad companies.....	4	Fertilizers.....	2	Instruments, professional and scientific.....	1
		Files.....	3	Iron and steel, steel works and rolling mills.....	2

STATISTICS OF MANUFACTURES—RHODE ISLAND.

THE STATE, BY INDUSTRIES: 1909.

		EXPENSES.										Value of products.	Value added by manufacture.
Capital.	Total.	Services.			Materials.			Miscellaneous.					
		Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.			
1	\$280,901,270	\$242,263,730	\$6,145,386	\$4,431,510	\$55,284,068	\$5,108,776	\$153,082,798	\$983,148	\$1,891,434	\$1,200,749	\$14,185,920	\$280,343,797	\$122,152,223
2	40,701	19,939	1,375	7,803	356	7,734	251	253	2,167	28,296	20,206		
3	282,000	200,642	9,100	4,600	25,294	2,580	147,954	120	1,191	9,797	242,848	92,308	
4	20,145	53,036	3,380	3,640	5,222	331	28,638	1,070	30	10,710	61,672	32,103	
5	121,274	103,021	4,080	3,900	27,682	1,947	55,022	4,330	902	5,062	142,080	85,111	
6	326,067	407,294	26,750	13,938	167,687	5,718	163,404	7,235	1,901	30,061	490,419	330,297	
7	500,238	731,872	20,342	4,571	117,907	14,469	534,506	2,243	1,071	375	35,428	827,598	278,623
8	1,435,924	3,484,014	36,442	46,470	660,443	72,610	2,397,948	47,931	7,484	215,680	3,936,864	1,460,306	
9	11,400	37,863	6,990	9,000	170	30,210	201	33	44	100	43,000	12,620	
10	128,940	168,005	4,200	2,072	98,157	3,518	83,254	1,834	444	1,408	202,634	116,862	
11	9,272	10,261	900	520	9,378	893	2,357	950			1,293	10,294	
12	408,410	347,504	10,546	4,388	151,721	7,672	155,495	4,222	2,416	475	10,571	421,913	258,746
13	204,412	442,333	13,375	21,743	29,364	1,262	320,725	1,146	374	20,568	24,676	153,888	
14	201,436	381,384	14,883	20,932	53,808	6,694	251,215	14,027	865		18,000	447,527	180,618
15	548,003	809,125	42,207	16,061	218,203	6,243	445,473	14,522	2,003	3,351	61,002	932,271	480,555
16	100,197	245,878	6,750	1,356	48,444	6,117	170,084	4,150	808		7,800	256,857	80,056
17	67,678,645	40,585,017	991,129	339,263	11,790,733	1,045,147	24,356,092	22,491	350,511	187,040	1,490,605	50,312,597	24,911,358
18	148,039	169,473	9,588	3,756	82,364	4,960	40,078	5,470	480	1,332	12,439	217,193	163,155
19	4,314,783	5,787,657	89,621	89,727	677,593	64,051	4,530,085	13,113	17,710		304,657	6,410,020	1,814,084
20	212,031	268,426	12,422	5,165	80,850	5,095	152,455	6,514	802		5,123	323,168	105,618
21	218,650	493,371	6,804	14,774	270,063	14,453	132,008	6,580	083	678	40,722	569,848	423,387
22	95,158	194,037	10,620	6,018	52,613	1,777	109,334	4,179	230	600	8,666	222,921	111,810
23	337,191	831,397	5,700	5,400	22,367	7,956	782,253	2,030	1,153		4,748	886,432	96,223
24	27,101,221	18,370,599	732,102	471,033	6,899,667	400,941	7,612,560	75,894	122,237	275,744	1,780,351	20,611,693	12,598,192
25	1,084,217	1,899,873	25,778	22,589	310,931	16,398	878,908	3,782	4,050	4,000	119,477	1,648,638	653,272
26	236,572	231,307	4,870	5,751	121,170	3,911	78,989	5,190	1,258	400	6,750	262,371	179,471
27	93,089	87,367	8,540	2,552	27,267	2,054	36,290	2,660	433	100	7,471	130,733	92,389
28	7,109,500	1,159,944	64,216	53,370	302,064	450,477	74,021	89,010			110,886	1,833,170	1,302,678
29	711,224	4,352,123	42,605	27,649	57,425	17,118	4,154,242	9,540	3,043		40,501	4,441,784	270,424
30	16,445	17,938		416	10,418	195	4,110	2,165	45		580	26,848	22,543
31	25,885	52,771	1,500	3,253	14,958	301	28,289	1,216	121		3,013	66,550	37,900
32	2,878,478	3,381,083	85,910	61,338	635,119	29,795	2,414,062	4,936	10,369	7,693	132,161	3,865,702	1,421,335
33	140,916	42,489	2,746	390	10,301	9,015	9,773	4,000	379		5,885	57,446	38,658
34	17,050,490	18,004,578	704,163	783,681	4,790,780	161,637	9,026,400	204,165	51,029	149,654	1,503,169	20,685,100	10,807,063
35	192,800	20,112	3,500	11,178	1,230	1,230	8,922	1,105	28		3,149	43,134	32,982
36	311,955	367,304	13,416	9,736	81,680	4,264	228,208	5,084	889	2,500	21,527	465,861	173,359
37	4,529,942	2,824,977	95,473	60,064	383,942	104,074	1,083,636	48	624,396		466,744	3,579,366	2,391,656
38	1,342,924	1,710,072	51,570	31,525	437,065	13,442	1,050,762	10,915	7,401	22,593	76,890	1,907,072	843,298
39	576,844	805,451	30,348	31,030	450,826	23,477	225,906	7,158	3,104	1,522	32,020	1,036,431	784,048
40	41,359	100,719	1,710	7,084	25,082	1,041	110,510	7,080	147		7,459	168,888	67,347
41	163,286	294,307	5,222	2,170	62,776	1,856	196,172	2,384	363	13,412	9,952	332,937	134,909
42	23,849	51,572		208	35,233	1,583	9,114	2,986	82		2,366	69,744	59,047
43	234,278	355,650	15,320	17,920	23,003	3,495	283,628	800	1,955		10,303	471,361	184,238
44	900,233	1,222,430	94,430	13,536	139,571	23,799	878,123	2,970	4,980		65,015	1,352,572	450,650
45	168,602	267,402	21,494	28,090	28,461	1,818	107,092	6,987	679		63,681	306,040	197,130
46	21,554	51,866	1,170	4,117	27,322	873	8,018	1,888	38	3,170	4,391	50,281	46,400
47	3,257,320	2,974,579	214,555	278,704	955,965	41,715	1,021,960	76,308	22,763	60,300	302,300	3,780,075	2,716,400
48	1,906,818	2,056,054	49,420	37,076	319,728	27,582	2,046,993	19,072	6,999		149,184	3,142,529	1,067,954
49	877,443	755,166	21,953	36,426	309,309	16,220	288,108	4,895	2,104		15,981	817,281	512,953
50	3,495,555	4,210,400	57,010	23,013	788,220	36,091	3,151,594	5,793	13,188	38,524	99,958	4,584,431	1,306,746
51	9,422,115	5,495,799	100,169	151,160	1,508,095	60,284	2,574,944	16,027	13,017	17,620	994,483	6,198,300	3,563,072
52	593,467	3,005,325	38,072	14,733	121,726	11,637	2,782,719	6,266			27,844	3,156,308	361,952
53	49,038	49,584	8,900	1,500	10,024	1,745	13,715	2,800			10,840	53,250	37,790
54	228,146	477,225	13,764	3,798	179,818	1,568	194,015	7,252	51,898		25,112	536,534	340,051
55	68,866,620	66,663,375	879,448	443,019	11,537,699	906,920	50,118,460	197,913	187,959	364,260	2,027,701	74,600,240	23,574,864
56	59,700,448	44,978,603	1,379,092	1,185,319	9,956,161	1,451,059	20,875,072	111,909	272,466	13,996	3,732,020	52,735,578	24,408,547

\* All other industries embrace—Continued.

Iron and steel, bolts, nuts, washers, and rivets, not made in steel works and rolling mills.....	5	Oil, cottonseed, and cake.....	1	Stoves and furnaces, including gas and oil stoves..	2
Iron and steel forgings.....	3	Oil, not elsewhere specified.....	3	Toys and games.....	2
Jewelry and instrument cases.....	1	Oleomargarine.....	4	Upholstering goods.....	1
Labels and tags.....	1	Optical goods.....	2	Vault lights and ventilators.....	1
Lead, bar, pipe, and sheet.....	2	Paper and wood pulp.....	1	Vinegar and cider.....	3
Leather, tanned, curried, and finished.....	3	Pens, fountain, stylographic, and gold.....	1	Washing machines and clothes wringers.....	1
Lime.....	1	Pulp goods.....	1	Waste.....	2
Liquors, distilled.....	2	Screws, wood.....	2	Window shades and fixtures.....	3
Looking-glass and picture frames.....	3	Sewing machines, cases, and attachments.....	1	Wire.....	1
Mineral and soda waters.....	37	Shoddy.....	3	Wirework, including wire rope and cable.....	7
Mucilage and paste.....	1	Soap.....	9	Wood, turned and carved.....	16
Musical instruments, pianos, and organs, and materials.....	1	Sporting and athletic goods.....	3	Wood scouring.....	2
		Steam packing.....	1		

## MANUFACTURES : SOUTH CAROLINA

## STATISTICS OF MANUFACTURES FOR THE STATE, CITIES, AND INDUSTRIES

Prepared under the supervision of W. M. STEUART, Chief Statistician for Manufactures

## INTRODUCTION.

This advance bulletin gives the statistics of manufactures for the state of South Carolina for the calendar year 1909 as shown by the Thirteenth Census. It will be reprinted without change as a part of the Compendium of the Census for South Carolina and in the final reports of the Thirteenth Census.

The text summarizes the general results of the census inquiry, presenting a series of special tables in which the main facts printed in the general tables are given in convenient form for the state as a whole and for important industries. It also presents tables in which the statistics for the industries of the state as a whole and for a few important industries are classified by character of ownership, size of establishments, number of wage earners, and prevailing hours of labor, information which could not be presented in general tables for each industry without disclosing the facts for individual establishments.

At the end of the bulletin are two general tables.

Table I gives for 1909, 1904, and 1899 the number of establishments and of persons engaged in the industries, primary power, capital, salaries and wages, cost of materials, value of products, and value added by manufacture reported for all industries combined and for certain important industries (1) for the state as a whole and (2) for the city of Charleston. It also gives the same items for all industries combined for every city having in 1910 a population of over 10,000 but less than 50,000.

Table II gives statistics in detail for 1909 for the state and for a larger number of industries.

**Scope of census: Factory industries.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of organization, location of establishments, size of establishments, labor force, and similar subjects. When use is made of the data for these purposes it is imperative that due attention should be given to the limitations of the figures. Particularly is this true when the attempt is made to derive from them figures purporting to show average wages, cost of production, or profits. These limitations will be fully discussed in the general report on manufactures for the United States as a whole. It is impossible to reproduce such discussion in the bulletins relative to the individual states.

The census of 1909, like that of 1904, was confined to manufacturing establishments conducted under the factory system, as distinguished from the neighborhood, hand, and building indus-

tries. Where statistics for 1899 are given they have been reduced to a comparable basis by eliminating the latter classes of industries. The census does not include establishments which were idle during the entire year, or had a value of products of less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions, or in governmental establishments, except those of the Federal Government.

**Period covered.**—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—The term "establishment" comprises the factories, mills, or plants which are under a common ownership or control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment as thus defined were not all located within the same city or state, separate reports were secured in order that the separate totals might be included in the statistics for each city or state. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products very different from those covered by the class designation, and, on the other hand, may not include the total product covered by this designation, because some part of this product may be made in establishments in which it is not the product of chief value.

**Selected industries.**—The general tables at the end of this bulletin give the principal facts separately for the industries of the state. A selection has been made of the leading industries of the state for more detailed consideration. Sometimes an industry of greater importance than some of those selected is omitted because it comprises so few establishments that these detailed presentations would reveal the operations of individual concerns.

**Comparisons with previous censuses.**—Owing to the changes in industrial conditions it is not always possible to classify establishments by industries in such a way as to permit accurate comparison with preceding censuses. Table I, giving comparable figures for 1909, 1904, and 1899, therefore, does not embrace all the industries shown for 1909 in Table II.

**Influence of increased prices.**—In considering changes in cost of materials, value of products, and value added by manufacture, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures can not be taken as an exact measure of increase in the volume of business.

**Persons engaged in industry.**—At the censuses of 1909, 1904, and 1899 the following general classes of persons engaged in manufacturing industries have been distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks, and (5) wage earners. In the censuses of 1904 and 1899 these five classes were shown according to the three main groups: (1) Proprietors and firm members, (2) salaried officials, clerks, etc., and (3) wage earners. The second group included the

three classes of salaried officers of corporations, superintendents and managers, and clerks. In the present census an entirely different grouping is employed: That into (1) proprietors and officials, (2) clerks, and (3) wage earners. The first group includes proprietors and firm members, salaried officers of corporations, and superintendents and managers.

At this census the number of persons engaged in the industries, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for December 15, or the nearest representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where conditions were exceptional, and particularly in the case of certain seasonal industries, such as canning, the December date could not be accepted as typical and an earlier date had to be chosen.

In the case of employees other than wage earners the number thus reported on December 15 or other representative day has been treated as equivalent to the average for the year, since the number of employees of this class does not vary much from month to month in a given industry. In the case of wage earners the average is obtained in the manner explained in the next paragraph.

**Wage earners.**—In addition to the report by sex and age of the number of wage earners on December 15 or other representative day, a report was obtained of the number employed on the 15th of each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because in view of the variations of date such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In particular, totals by sex and age for the wage earners reported for the representative day would be misleading because of the undue weight given to seasonal industries, in some of which, such as canning and preserving, the distribution of the wage earners by sex and age is materially different from that in most industries of more regular operation. In order to determine as nearly as possible the sex and age distribution of the average number of wage earners in the state as a whole, the following procedure has been adopted:

The percentage distribution by sex and age of the wage earners in each industry, for December 15 or the nearest representative day, has been calculated from the actual numbers reported for that date. This percentage has been applied to the average number of wage earners for the year in that industry, to determine the average number of men, women, and children employed. These calculated averages for the several industries have been added up to give the average distribution for the state as a whole.

In 1899 and 1904 the schedule called for the average number of wage earners of each sex 16 years and over, and the total number under 16 years of age, for each month, and these monthly statements were combined in an annual average. Comparatively few manufacturing concerns, however, keep their books in such way as to show readily the number of men, women, and children (under 16) employed each month. These monthly returns by sex and age were, in fact, largely estimates. It was believed that a more accurate and reliable sex and age distribution could be secured by taking as a basis of estimate the actual numbers employed on a single day.

**Prevailing hours of labor.**—The census made no attempt to ascertain the number of employees working a given number of hours

per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and no attention is given to the fact that a limited number of employees may have hours different from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

**Capital.**—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

**Materials.**—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term materials includes fuel, rent of power and heat, mill supplies, and containers, as well as materials forming a constituent part of the product. Fuel includes all fuel used, whether for heat, light, or power, or for the process of manufacture.

**Expenses.**—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness and allowances for depreciation.

**Value of products.**—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

**Value added by manufacture.**—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishments. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "value added by manufacture."

**Cost of manufacture and profits.**—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products the rate of profit on the investment could not properly be calculated because of the very defective character of the returns regarding capital.

**Primary power.**—The figures given for this item show the total of the primary power used by the establishments. They do not cover the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

**Location of establishments.**—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the fact that often establishments are located just outside the boundaries of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

**Laundries.**—The census of 1909 was the first to include statistics

of laundries. The reports are confined to establishments using mechanical power. The data are presented separately and are not included in the general total for manufacturing industries, in order to avoid interference with comparisons with prior censuses.

**Custom grist and saw mills.**—In order to make the statistics for 1909 comparable with those for 1904 the data for these mills have been excluded from all the tables presenting general statistics, and are given in a separate table at the end of this report.

**INDUSTRIES IN GENERAL.**

**General character of the state.**—South Carolina, with a gross area of 30,989 square miles, of which 494 represent water surface, ranks thirty-ninth in size among the states and territories of continental United States. Its population in 1910 was 1,515,400, as compared with 1,340,316 in 1900 and 1,151,149 in 1890. The density of population for the entire state was 49.7 per square mile in 1910, the corresponding figure for 1900 being 44. It ranked twenty-sixth among the 49 states and territories as regards population in 1910 and twenty-fourth in 1900. In 1909 as well as in 1899 it ranked thirty-second among the states in respect to gross value of manufactured products. Charleston, with a population of 58,833, is the only city in the state having a population of over 50,000. There are, however, three other cities each of which has a population of over 10,000. These four cities, Charleston, Columbia, Greenville, and Spartanburg, contain 7.8 per cent of the total population and are credited with 16.1 per cent of the total value of manufactured products of the state.

The transportation facilities of South Carolina are excellent. Of the 3,397<sup>1</sup> miles of steam-railroad trackage in the state in 1909, the greater portion is owned by the several companies which operate the important trunk lines of the South. There are also many less important roads which serve as feeders to these main lines. Charleston, one of the important seaports

on the southern Atlantic coast, together with two other ports in the state, afford ample opportunities for domestic and foreign commerce. Furthermore, the principal rivers of the state, which are navigable to a considerable extent, afford additional means of transportation.

**Importance and growth of manufactures.**—Although South Carolina is preeminently an agricultural community, at each census from 1869-70 to 1909 the manufactures of the state have represented an increased proportion of the total value of products of the manufacturing industries in the United States. This proportion in 1869-70 was two-tenths of 1 per cent, while in 1899 and in 1909 it was one-half of 1 per cent.

In 1849-50 the total value of the manufactures of the state, including the products of the neighborhood and hand industries, amounted to only \$7,045,477, while in 1909, exclusive of the value of the products of the neighborhood and hand industries, it reached \$113,235,945, representing an increase of fifteen fold. During the same period the population of the state increased 126.7 per cent, and the gross value of products per capita of the total population of the state increased from \$11 to \$75.

The following table gives the most important figures relative to all classes of manufactures combined for 1909, 1904, and 1899, together with the percentages of increase from census to census:

	NUMBER OR AMOUNT.			PER CENT OF INCREASE.	
	1909	1904	1899	1904-1909	1899-1904
Number of establishments.....	1,854	1,399	1,369	32.5	2.2
Persons engaged in manufactures.....	78,040	63,071	( <sup>1</sup> )	23.7	( <sup>1</sup> )
Proprietors and firm members.....	1,737	1,241	( <sup>1</sup> )	40.0	( <sup>1</sup> )
Salaried employees.....	3,257	2,389	1,419	36.3	68.4
Wage earners (average number).....	73,046	59,441	47,025	22.9	26.4
Primary horsepower.....	276,378	197,479	112,697	40.0	75.2
Capital.....	\$173,221,000	\$113,422,000	\$62,750,000	52.7	80.8
Expenses.....	97,371,000	72,206,000	44,055,000	34.9	63.9
Services.....	24,117,000	16,224,000	10,438,000	48.6	55.4
Salaries.....	3,756,000	2,355,000	1,308,000	59.5	80.0
Wages.....	20,361,000	13,869,000	9,130,000	46.8	51.9
Materials.....	66,351,000	49,969,000	30,486,000	32.8	63.9
Miscellaneous.....	6,903,000	6,013,000	3,131,000	14.8	92.0
Value of products.....	113,236,000	79,376,000	53,336,000	42.7	48.8
Value added by manufacture (value of products less cost of materials).....	46,885,000	29,407,000	22,850,000	59.4	28.7

<sup>1</sup> Figures not available.

In 1909 the state of South Carolina had 1,854 manufacturing establishments which gave employment to an average of 78,040 persons during the year and paid out

\$24,117,000 in salaries and wages. Of the persons employed, 73,046 were wage earners. These establishments turned out products to the value of \$113,236,000, to produce which materials costing

<sup>1</sup> Report of Interstate Commerce Commission, 1909.

## STATISTICS OF MANUFACTURES—SOUTH CAROLINA.

\$66,351,000 were used. The value added by manufacture was thus \$46,885,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year.

The totals presented in the preceding table do not include the statistics for an establishment operated by the Federal Government—the United States navy yard located just beyond the corporate limits of Charleston. In 1909 this plant employed an average of 571 wage earners, and the expense of repair work at the yard during that year was reported at \$876,098.

In general, this table brings out the fact that the manufacturing industries of South Carolina not only increased considerably during each period, but that as a whole there was a greater development during the five-year period 1899–1904 than during the more

recent five-year period 1904–1909. During the period 1904–1909 the number of establishments increased 32.5 per cent, the average number of wage earners 22.9 per cent, the cost of materials 32.8 per cent, the value of products 42.7 per cent, and the value added by manufacture 59.4 per cent. The differences in the increases shown for the two five-year periods in the cost of materials and in the value added by manufacture are noteworthy. As pointed out in the Introduction, it would be improper to infer that manufactures increased in volume to the full extent indicated by these figures regarding values, since the increase shown is certainly due, in part, to the increase that has taken place in the price of commodities.

The relative importance and growth of the leading manufacturing industries of the state are shown in the following table:

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.		PER CENT OF INCREASE. <sup>1</sup>			
		Average number.	Per cent distribution.	Amount.	Per cent distribution.	Amount.	Per cent distribution.	Value of products.		Value added by manufacture.	
								1904-1909	1899-1904	1904-1909	1899-1904
<b>All industries.....</b>	<b>1,854</b>	<b>73,046</b>	<b>100.0</b>	<b>\$113,236,000</b>	<b>100.0</b>	<b>\$46,885,000</b>	<b>100.0</b>	<b>42.7</b>	<b>48.8</b>	<b>59.4</b>	<b>38.7</b>
Cotton goods, including cotton small wares.....	147	45,454	62.2	65,030,000	58.2	24,627,000	52.5	33.4	66.3	62.8	21.4
Lumber and timber products.....	851	14,604	20.0	13,141,000	11.6	9,160,000	19.5	58.7	38.9	58.7	63.6
Oil, cottonseed, and cake.....	103	1,765	2.4	10,903,000	9.6	2,183,000	4.7	99.6	76.1	139.9	23.0
Fertilizers.....	26	1,851	2.5	9,025,000	8.0	3,396,000	7.2	148.1	-25.5	259.0	-40.7
Printing and publishing.....	161	834	1.1	1,601,000	1.4	1,261,000	2.7	54.2	31.6	53.0	37.1
Cars and general shop construction and repairs by steam-railroad companies.....	10	1,418	2.0	1,499,000	1.3	753,000	1.6	38.7	56.4	16.2	63.2
Bread and other bakery products.....	63	369	0.5	1,100,000	1.0	370,000	0.8	78.0	17.7	51.6	22.8
Brick and tile.....	45	888	1.2	731,000	0.6	463,000	1.0	11.4	14.5	-3.3	8.6
Hosiery and knit goods.....	7	839	1.1	655,000	0.6	321,000	0.7	-30.3	175.3	-34.9	220.1
Foundry and machine-shop products.....	34	417	0.6	547,000	0.5	369,000	0.8	0.9	34.5	-0.5	57.2
Carriages and wagons and materials.....	23	272	0.4	464,000	0.4	220,000	0.5	-15.3	32.4	-14.7	24.0
Ice, manufactured.....	32	218	0.3	433,000	0.4	304,000	0.6	77.5	110.3	79.9	113.9
Marble and stone work.....	36	230	0.3	426,000	0.4	282,000	0.6				
Turpentine and rosin.....	56	443	0.6	406,000	0.4	242,000	0.5	-20.3	-27.2	21.0	-36.9
Flour-mill and gristmill products.....	10	23	( <sup>2</sup> )	351,000	0.3	43,000	0.1	-51.6	-16.6	-53.3	-31.9
Gas, illuminating and heating.....	12	127	0.2	334,000	0.3	220,000	0.5	73.1	12.2	64.2	
Canning and preserving.....	16	407	0.6	318,000	0.3	159,000	0.3				
Copper, tin, and sheet-iron products.....	8	79	0.1	290,000	0.2	94,000	0.2	400.0	-66.5	248.1	-47.1
Clothing, men's, including shirts.....	5	99	0.1	130,000	0.1	45,000	0.1				
Coffins, burial cases, and undertakers' goods.....	4	77	0.1	127,000	0.1	65,000	0.1	0.8	96.9	-26.1	183.9
Mattresses and spring beds.....	4	46	0.1	107,000	0.1	43,000	0.1	10.3	-15.7	19.4	-36.8
All other industries.....	202	2,520	3.5	4,790,000	4.2	2,259,000	4.8				

<sup>1</sup> Per cent of increase is based on figures in Table I, and a minus sign (-) denotes a decrease. Where percentages are omitted the figures are not comparable.

<sup>2</sup> Less than one-tenth of 1 per cent.

It should be borne in mind, in considering this table, that the value of products in some of the industries involves a certain amount of duplication, due to the use of the products of one establishment in the industry as material for another establishment.

In addition to the industries separately presented, there are four important industries, each of which had a value of products in 1909 in excess of \$400,000. They are included under the head of "All other industries" in the table, because in some cases the operations of individual establishments would be disclosed if they were shown separately, in others be-

cause the returns do not properly present the true condition of the industry, for the reason that it is more or less interwoven with one or more other industries. These industries are: The manufacture of cordage and twine, jute and linen goods, the mineral and soda water industry, the cleaning and polishing of rice, and the manufactures from tobacco.

Four industries, two of which use cotton as a principal material, greatly predominate in importance. The most important industries listed in the table given above, in which they are arranged in the order of the value of products, call for brief consideration.

*Cotton goods, including cotton small wares.*—This industry consists entirely of mills primarily engaged in the manufacture of cotton goods, no establishment being reported where the output of cotton small wares predominates. It is by far the most important industry in the state. In 1909 it gave employment to an average of 45,454 wage earners, and the value of its products amounted to \$65,930,000, these figures representing 62.2 per cent and 58.2 per cent, respectively, of the corresponding totals for all manufacturing industries in the state. Measured by value of products, South Carolina is third in order of importance among the states in the production of cotton goods. That the percentage of increase in value added by manufacture was much less from 1899-1904 than from 1904-1909 was due in part to the fluctuation in the price of raw cotton.

*Lumber and timber products.*—This industry includes, in addition to the timber plants, the chief products of which are logs and bolts, the sawmills, shingle mills, and planing mills, producing rough lumber, shingles, lath, cooperage stock, sash, doors, blinds, interior finish, and other millwork, and also the wooden packing-box factories. The number of establishments included in this industry largely exceeds the number engaged in any other industry in the state.

*Oil, cottonseed, and cake.*—The statistics include those for all establishments engaged primarily in extracting oil from cotton seed or in refining crude cottonseed oil. The industry is entirely dependent upon the production of cotton, and utilizes the seed, which until recently was practically treated as waste. Since 1899 the number of establishments has increased rapidly, and the varied uses for cottonseed products have greatly stimulated the industry.

*Fertilizers.*—South Carolina was the first state in the Union to mine and to utilize phosphate rock as the basis of commercial fertilizer. For many years following 1867, when the rock was first mined, this state produced the larger part of the world's supply. The rapid growth of the cottonseed-oil industry in the state has caused a marked development of this industry, for cottonseed meal is one of the best ammoniates, and is an important ingredient in the manufacture of fertilizers. The value of products for the industry was \$4,882,506 in 1899 compared with \$3,637,576 in 1904 and \$9,024,900 in 1909, a decrease from 1899 to 1904 of \$1,244,930, or 25.5 per cent, but an increase of \$5,387,324, or 148.1 per cent, from 1904 to 1909. Measured by value of products, the fertilizer industry was third in importance in 1899 among the industries of the state, whereas in 1904 and 1909 it held fourth place. In 1899 South Carolina was the second state in the Union in this class of manufacture. It dropped to sixth place in 1904, but by 1909 it had nearly regained its former position by becoming third in importance.

*Printing and publishing.*—Establishments engaged in the printing and publishing of newspapers and periodicals, book and job printing, and lithographing are included in this classification, which reported a total of 161 establishments in 1909, gave employment to an average of 834 wage earners in that year, and turned out products valued at \$1,601,000.

*Cars and general shop construction and repairs by steam-railroad companies.*—This class of manufacture represents the work done in the car shops of steam-railroad companies, and is practically confined to repairs to the rolling stock and equipment. The statistics do not include minor repairs made in round-houses. The industry was fifth in the state in 1909 in the employment of wage earners, with an average of 1,418 for the year.

With the exception of the fertilizer and cottonseed-oil industries, which exchanged places, these six industries held the same relative positions when measured by value added by manufacture as when measured by value of products.

*Turpentine and rosin.*—While this industry does not rank among the most important, it is one of the oldest and is closely identified with the industrial development of the state. There was a decrease in the value of products both between 1899 and 1904, and between 1904 and 1909. The value added by manufacture also decreased between 1899 and 1904 but increased in the succeeding period.

This table shows also the percentages of increase for these leading industries in respect to value of products and value added by manufacture. With the exception of the manufacture of copper, tin, and sheet-iron products, the fertilizer industry showed a greater rate of increase from 1904 to 1909 than any other of the industries shown separately, both in the value added by manufacture and in value of products, namely, 259 per cent and 148.1 per cent, respectively. In the cottonseed-oil, ice, lumber, gas, and bakery industries the gross value of products and the value added by manufacture increased greatly during the same period. Five of the industries listed, namely, hosiery and knit goods, carriage and wagon, turpentine and rosin, flour and gristmill, and canning and preserving, decreased in value of products from 1904 to 1909, while the fertilizer, the turpentine and rosin, the flour and gristmill, the copper, tin, and sheet-iron products, and the mattress and spring-bed industries decreased from 1899 to 1904. Seven industries decreased in value added by manufacture from 1904 to 1909, while five decreased from 1899 to 1904, but with the exception of fertilizers none of these decreases are for industries of great importance in the state. The percentages of increase are not given for marble and stone work and for men's clothing, because the statistics for these two industries for previous censuses are not comparable.

Persons engaged in manufacturing industries.—The following table shows, for 1909, the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables is an estimate obtained by the method described in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes.....	78,040	60,944	17,096
Proprietors and officials.....	3,333	3,287	46
Proprietors and firm members.....	1,737	1,697	40
Salariated officers of corporations.....	606	603	3
Superintendents and managers.....	990	987	3
Clerks.....	1,661	1,303	268
Wage earners (average number).....	73,046	56,264	16,782
16 years of age and over.....	63,641	50,848	12,793
Under 16 years of age.....	9,405	5,416	3,989

The average number of persons engaged in manufactures during 1909 was 78,040, of whom 73,046 were wage earners. Of the remainder, 3,333 were proprietors and officials, and 1,661 were clerks. Corresponding figures for individual industries will be found in Table II.

The following table shows, for 1909, the percentage of proprietors and officials, clerks, and wage earners, respectively, among the total number of persons employed in manufactures. It covers all industries combined and 11 important industries individually.

INDUSTRY.	PERSONS ENGAGED IN MANUFACTURES.			
	Total number.	Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
All industries.....	78,040	4.3	2.1	93.6
Bread and other bakery products.....	521	16.5	12.7	70.8
Brick and tile.....	900	0.0	1.3	89.7
Cars and general shop construction and repairs by steam-railroad companies.....	1,483	0.5	3.8	95.6
Cotton goods, including cotton small wares.....	46,342	1.0	1.0	98.1
Fertilizers.....	2,057	3.4	6.7	90.0
Foundry and machine-shop products.....	477	9.2	3.4	87.4
Hosiery and knit goods.....	864	1.7	1.2	97.1
Lumber and timber products.....	16,330	8.8	1.8	89.4
Oil, cottonseed, and cake.....	2,130	12.1	7.3	80.6
Printing and publishing.....	1,294	10.4	16.2	64.5
Turpentine and rosin.....	524	14.9	0.6	84.5
All other industries.....	4,908	10.9	5.3	83.8

Of the total number of persons engaged in all manufacturing industries, 4.3 per cent were proprietors and officials, 2.1 per cent clerks, and 93.6 per cent wage earners. In the printing and publishing and the bakery industries the majority of the establishments are small and the work is to a large extent done by the proprietors or their immediate representatives, so that

the proportion of persons engaged in these industries falling in the class of proprietors and officials is very much higher than for most other industries or for all industries combined. Similar conditions prevail to some extent in the manufacture of turpentine and rosin, where the proprietors and officials form 14.9 per cent of the total number of persons engaged. The proportion is also large in the manufacture of cottonseed products, 12.1 per cent, which is due to the fact that the industry in the state is conducted in relatively small establishments measured by number of wage earners employed. The smallest proportion for this class is found in the steam-railroad repair shops, and is due to the fact that corporations which operate these establishments report no proprietors, and that general officials are not as a rule assigned to the supervision of this particular branch of the work.

In the cotton goods industry the proportion of proprietors and officials is exceedingly small on account of the large average number of wage earners to an individual establishment.

The following table shows, in percentages, for 1909, for all industries combined the distribution of the average number of wage earners, by age periods and for those 16 years of age and over by sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries separately, a similar distribution of wage earners as reported for December 15, or the nearest representative day. As a means of judging the importance of the several industries the total average number employed for the year is also given in each case.

INDUSTRY.	WAGE EARNERS.			
	Average number. <sup>1</sup>	Per cent of total.		
		16 years of age and over.		Under 16 years of age.
		Male.	Female.	
All industries.....	73,046	69.6	17.5	12.9
Bread and other bakery products.....	300	79.4	12.2	8.4
Brick and tile.....	888	94.1		5.0
Cars and general shop construction and repairs by steam-railroad companies.....	1,418	99.9	0.1	0.1
Cotton goods, including cotton small wares.....	45,454	56.6	24.7	18.7
Fertilizers.....	1,851	100.0		
Foundry and machine-shop products.....	417	97.4	2.6	
Hosiery and knit goods.....	830	35.6	45.6	18.7
Lumber and timber products.....	14,604	98.5	0.1	1.5
Oil, cottonseed, and cake.....	1,765	99.8	0.1	0.1
Printing and publishing.....	834	78.5	15.0	6.5
Turpentine and rosin.....	443	94.8	3.4	1.8
All other industries.....	4,164	67.6	23.1	9.3

<sup>1</sup> For method of estimating the distribution, by sex and age periods, of the average number in all industries combined, see Introduction.

For all industries combined, 69.6 per cent of the average number of wage earners were males 16 years of age and over; 17.5 per cent females 16 years of age and over; and 12.9 per cent persons under the age of 16. The larger part of the total number of female wage earners is made up of those employed in

the two textile industries. In the cotton mills nearly one-fourth of the employees are women 16 years of age and over and in the knitting mills nearly one-half are of this class.

The two textile industries combined also include the larger part of the total number of wage earners under 16 years of age. In both of these industries the proportion (18.7 per cent) of such wage earners to the total is the same.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904, it is necessary to use the classification employed at the earlier census. (See Introduction.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				
	1909		1904		Percent of Increase, 1904-1909.
	Number.	Percent distribution.	Number.	Percent distribution.	
Total.....	78,040	100.0	63,071	100.0	23.7
Proprietors and firm members.....	1,737	2.2	1,241	2.0	40.0
Salaried employees.....	3,257	4.2	2,389	3.8	36.3
Wage earners (average number).....	73,046	93.6	59,441	94.2	22.9

Comparable figures are not obtainable for 1899. The proprietors and firm members and the salaried employees constituted a somewhat larger proportion of the total number engaged in manufactures in 1909 than in 1904.

The following table shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over according to sex, for 1909, 1904, and 1899. The averages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Percent distribution.	Number.	Percent distribution.	Number.	Percent distribution.
Total.....	73,046	100.0	59,441	100.0	47,025	100.0
16 years of age and over.....	63,641	87.1	49,672	83.6	38,545	82.0
Male.....	50,848	69.6	37,653	63.3	29,097	61.9
Female.....	12,793	17.5	12,019	20.2	9,448	20.1
Under 16 years of age.....	9,405	12.9	9,769	16.4	8,480	18.0

This table indicates that for all industries combined there has been a decrease during the 10 years in the proportionate employment of children under 16 years of age, although the average number had increased during that time. There was not much change from 1899 to 1904 in the proportion of adult male and female wage earners, but from 1904 to 1909 the proportion of females 16 years of age and over decreased from 20.2 per cent to 17.5 per cent, although the average

number increased from 12,019 to 12,793. The proportion of males 16 years of age and over increased from 61.9 per cent in 1899 to 63.3 per cent in 1904 and 69.6 per cent in 1909.

**Wage earners employed by months.**—The following table gives the number of wage earners employed on the 15th of each month during the year 1909, for all industries combined, for the cottonseed oil and cake industry, and for all other industries combined; it gives also the percentage which the number reported for each month is of the greatest number employed in any month. In Table II, page 18, is shown for practically all of the important industries in the state, the largest number and also the smallest number of wage earners reported for any month. The figures are for the 15th day, or the nearest representative day of the month.

MONTH.	NUMBER OF WAGE EARNERS.					
	All industries.		Oil, cottonseed, and cake.		All other industries.	
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January.....	73,774	96.6	2,736	94.7	71,038	95.7
February.....	75,600	99.1	2,608	90.3	73,088	98.4
March.....	70,373	100.0	2,128	73.7	74,245	100.0
April.....	72,682	95.2	1,482	51.3	71,200	95.9
May.....	70,310	92.1	502	20.5	69,718	93.9
June.....	70,283	92.0	539	18.7	69,744	93.9
July.....	70,708	92.6	524	18.1	70,184	94.5
August.....	70,441	92.2	521	18.0	69,920	94.2
September.....	71,961	94.2	1,647	57.0	70,304	94.7
October.....	73,996	96.9	2,649	91.7	71,347	96.1
November.....	74,766	97.9	2,804	99.2	71,962	96.8
December.....	75,585	99.0	2,888	100.0	72,697	97.9

The average number of wage earners employed in all industries combined shows very little irregularity during the year. The largest number, 76,373, was employed in March, and the smallest number, 70,283, in June, the difference between these figures being only 6,090, or 8 per cent. The cottonseed-oil and cake and the brick and tile industries are more or less seasonal; but as the numbers employed in these industries are comparatively small, the variations do not materially affect the totals for the state. The most marked fluctuation is in the cottonseed-oil industry, in which the number employed in May, June, July, and August ranged from 18 per cent to 20.5 per cent of the number employed in December, the month of maximum employment.

**Prevailing hours of labor.**—In the table following wage earners have been classified according to the hours of labor prevailing in the establishments in which they are employed. In making this classification the average number of wage earners employed during the year 1909 is used and the number employed in each establishment is classified as a total according to the hours prevailing in that establishment, even though a few employees work a greater or less number of hours.

## STATISTICS OF MANUFACTURES—SOUTH CAROLINA.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
<b>All industries.....</b>	<b>73,046</b>	<b>1,431</b>	<b>1,291</b>	<b>1,778</b>	<b>1,391</b>	<b>61,647</b>	<b>3,211</b>	<b>2,098</b>	<b>259</b>
Bread and other bakery products.....	360	6	4	12	1	236	19	88	3
Brick and tile.....	388	68	12	.....	46	594	147	21	.....
Canning and preserving.....	467	52	10	24	.....	375	.....	6	.....
Carriages and wagons and materials.....	272	.....	10	.....	.....	261	1	.....	.....
Cars and general shop construction and repairs by steam-railroad companies.....	1,418	.....	.....	1,252	.....	107	59	.....	.....
Clothing, men's, including shirts.....	99	.....	.....	5	94	.....	.....	.....	.....
Coffins, burial cases, and undertakers' goods.....	77	.....	.....	.....	.....	77	.....	.....	.....
Copper, tin, and sheet-iron products.....	79	.....	.....	48	.....	31	.....	.....	.....
Cotton goods, including cotton small wares.....	45,454	.....	445	.....	.....	45,009	.....	.....	.....
Fertilizers.....	1,851	.....	.....	4	.....	1,798	6	43	.....
Foundry and machine-shop products.....	417	.....	.....	190	22	201	4	.....	.....
Gas, illuminating and heating.....	127	1	.....	.....	.....	.....	14	.....	112
Hosiery and knit goods.....	830	.....	.....	.....	.....	830	.....	.....	.....
Ice, manufactured.....	218	.....	.....	.....	.....	28	16	55	119
Lumber and timber products.....	14,604	567	623	72	732	9,677	2,586	337	.....
Marble and stone work.....	236	70	31	7	26	162	.....	.....	.....
Oil, cottonseed, and cake.....	1,765	.....	.....	.....	2	.....	280	1,351	10
Printing and publishing.....	834	330	122	126	34	196	7	13	.....
Turpentine and rosin.....	443	174	23	.....	.....	246	.....	.....	.....
All other industries.....	2,589	167	11	38	424	1,754	60	124	15

It is evident from these figures that for the great majority of wage earners employed in the manufacturing industries of South Carolina the prevailing hours of labor are 60 a week, only 8.1 per cent of the total being employed in establishments where less than 60 hours a week prevail, and 7.5 per cent in establishments working more than these hours.

In the manufacture of cotton goods 99 per cent and in the lumber industry 66.3 per cent of the wage earners work 60 hours a week. These two industries combined gave employment to 82.2 per cent of the total average number of wage earners engaged in all manufacturing industries in the state in 1909.

The cottonseed-oil industry is mainly on a 72-hours-per-week basis. Relatively long hours are what might be expected in a seasonal industry where the operations for the entire year are principally confined to a few months. Steam-railroad repair shops are mainly on a 54-hours-per-week basis.

**Location of establishments.**—The next table shows the extent to which the manufactures of South Carolina are centralized in cities of 10,000 population or over. (See Introduction.) The population in 1900 was used as the basis in making the classification for 1904, as well as for 1899, and the classification for 1909 was made on the basis of the population in 1910.

In 1909 only 16.1 per cent of the total value of products was reported from the four cities having over 10,000 inhabitants, and only 11.4 per cent of the average number of wage earners were employed in such cities. This is primarily due to the fact that the establishments of the two leading and most highly developed industries of the state, the cotton goods and lumber industries, are largely located outside the corporate limits of the cities, although the former indus-

try is the most important in each of the cities, except Charleston. The figures indicate that while very little relative change took place during the 5 or 10 years, yet on the whole the manufacturing industries of the districts outside of the cities gained on those of the cities.

ITEM.	Year.	Total.	LOCATION OF ESTABLISHMENTS.		PER CENT OF TOTAL.	
			In cities with population of 10,000 and over.	Outside districts.	In cities with population of 10,000 and over.	Outside districts.
Population.....	1910	1,515,400	118,410	1,396,990	7.8	92.2
	1900	1,340,316	100,170	1,240,146	7.5	92.5
Number of establishments.	1909	1,851	248	1,606	13.4	86.6
	1904	1,399	220	1,179	15.7	84.3
	1899	1,369	195	1,174	14.2	85.8
Average number of wage earners.	1909	73,046	8,351	64,695	11.4	88.6
	1904	59,441	8,607	50,744	14.6	85.4
	1899	47,025	7,409	39,616	15.8	84.2
Value of products.	1909	\$113,235,945	\$18,240,484	\$94,995,461	16.1	83.9
	1904	79,376,262	14,488,514	64,887,748	18.3	81.7
	1899	53,335,811	11,404,995	41,930,816	21.4	78.6
Value added by manufacture.	1909	46,885,071	7,120,347	39,764,724	15.2	84.8
	1904	29,407,636	5,453,894	23,953,742	18.5	81.5
	1899	22,849,950	4,425,966	18,423,984	19.4	80.6

The population, for 1910 and 1900, of the four cities which had 10,000 inhabitants or over in 1910 is given in the following statement:

CITY.	POPULATION.	
	1910	1900
Charleston.....	58,833	55,807
Columbia.....	26,319	21,168
Spartanburg.....	17,517	11,305
Greenville.....	15,741	11,866

The relative importance in manufacturing industry of each of these four cities is shown in the table following, in which the value of products and average number of wage earners are shown separately for 1909, 1904, and 1899:

CITY.	AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.		
	1909	1904	1899	1909	1904	1899
	Charleston.....	2,874	3,450	3,187	\$6,950,807	\$6,007,004
Columbia.....	2,522	2,393	2,091	5,871,820	4,676,944	3,133,903
Spartanburg.....	1,773	1,650	1,361	3,275,711	2,127,702	1,501,325
Greenville.....	1,182	1,204	770	2,142,146	1,676,774	966,452

Each of the cities shows an increase in value of products from 1904 to 1909, as well as from 1899 to 1904, but, with the exception of Spartanburg, the percentages of increase for the former period were less for each of the cities than for the state as a whole. Although Charleston shows an increase of 15.7 per cent in value of products for the later five-year period, the number of wage earners decreased 16.7 per cent. Likewise, in Greenville the number of wage earners decreased 1.8 per cent, while the value of products increased 27.8 per cent.

Charleston, the largest and most important manufacturing city in the state, owes its position to a wide diversity of industries, of which the most important, as measured by value of products, are the fertilizer, the bakery, the lumber and timber, the printing and publishing, the cottonseed-oil and cake industries, the manufacture of jute and jute goods, and the cleaning and polishing of rice.

**Character of ownership.**—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available. Figures for 1909 only are presented for several important industries individually. In order to avoid disclosing the operations of individual concerns it is necessary to omit several important industries from this and the table following.

The most important distinction shown is that between corporate and all other forms of ownership. For all industries combined, 30.4 per cent of the total number of establishments were in 1909 under corporate ownership, as against 69.5 per cent under all other forms. The corresponding figures for 1904 were 33.2 per cent and 66.8 per cent, respectively. The establishments under corporate ownership, however, produced nine-tenths of the total value of products in 1909. For all industries combined, as measured by value of products and value added by manufacture, corporations gained to some extent, due principally to the growth of the cotton-goods industry, in which practically all of the mills are under corporate ownership.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>				
1909.....	1,854	73,046	\$113,235,045	\$46,885,071
1904.....	1,399	59,441	79,376,262	29,407,639
<b>Individual:</b>				
1909.....	940	6,243	6,816,852	4,108,834
1904.....	672	5,172	5,764,439	3,235,540
<b>Firm:</b>				
1909.....	340	3,342	3,077,830	2,247,008
1904.....	256	2,745	3,000,404	1,751,726
<b>Corporation:</b>				
1909.....	564	63,455	102,403,671	40,434,017
1904.....	464	51,510	70,493,378	24,398,500
<b>Other:</b>				
1909.....	10	6	37,583	35,122
1904.....	7	14	27,061	21,970
<b>Per cent of total:</b>				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
<b>Individual:</b>				
1909.....	50.7	8.5	6.0	8.9
1904.....	48.0	8.7	7.3	11.0
<b>Firm:</b>				
1909.....	18.3	4.6	3.5	4.8
1904.....	18.3	4.6	3.9	6.0
<b>Corporation:</b>				
1909.....	30.4	86.9	90.4	80.2
1904.....	33.2	80.7	88.8	83.0
<b>Other:</b>				
1909.....	0.5	( )	( )	0.1
1904.....	0.5	( )	( )	0.1
<b>Bread and other bakery products, 1909.</b>				
Individual.....	69	369	\$1,000,920	\$376,006
Firm.....	57	183	555,106	237,164
Corporation.....	6	189	514,724	138,842
<b>Per cent of total:</b>				
Individual.....	100.0	100.0	100.0	100.0
Firm.....	90.6	49.6	53.2	63.1
Corporation.....	9.5	50.4	46.8	36.9
<b>Lumber and timber products, 1909.</b>				
Individual.....	851	14,604	\$19,140,886	\$9,159,418
Firm.....	563	4,171	3,226,614	2,303,315
Corporation.....	108	2,206	2,018,903	1,382,491
Other.....	99	8,137	7,895,279	5,413,612
<b>Per cent of total:</b>				
Individual.....	100.0	100.0	100.0	100.0
Firm.....	66.2	28.6	24.6	25.8
Corporation.....	23.3	15.7	15.4	15.1
Other.....	10.6	65.7	60.1	59.1
<b>Oil, cottonseed, and cake, 1909.</b>				
Individual.....	103	1,765	\$10,602,035	\$2,183,400
Firm.....	4	42	225,704	34,314
Corporation.....	0	66	505,913	115,748
Other.....	03	1,627	10,081,228	2,033,338
<b>Per cent of total:</b>				
Individual.....	100.0	100.0	100.0	100.0
Firm.....	3.9	2.4	2.1	1.6
Corporation.....	6.8	5.4	5.6	5.3
Other.....	90.3	92.2	92.6	93.1
<b>Printing and publishing, 1909.</b>				
Individual.....	161	834	\$1,000,591	\$1,280,672
Firm.....	83	268	387,400	309,331
Corporation.....	55	150	213,157	100,922
Other.....	37	404	900,201	757,237
Other.....	6	6	33,743	33,182
<b>Per cent of total:</b>				
Individual.....	100.0	100.0	100.0	100.0
Firm.....	51.6	32.1	24.2	24.5
Corporation.....	21.7	18.7	13.3	12.8
Other.....	23.0	48.4	60.4	60.1
Other.....	3.7	0.7	2.1	2.6

<sup>1</sup> Less than one-tenth of 1 per cent.

<sup>2</sup> Includes the group "Corporation," to avoid disclosure of individual operations.

**Size of establishment.**—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it the table which follows groups the establishments according to the value of their products. The table also shows the average size of establishments for all industries combined and for important industries separately as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the last two censuses, while for certain important industries figures are given for 1909 only.

## STATISTICS OF MANUFACTURES—SOUTH CAROLINA.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>				
1909.....	1,854	73,046	\$113,235,945	\$48,885,071
1904.....	1,399	59,441	79,376,262	29,407,636
<b>Less than \$5,000:</b>				
1909.....	812	2,473	1,744,344	1,247,783
1904.....	544	1,425	1,257,021	871,350
<b>\$5,000 and less than \$20,000:</b>				
1909.....	507	4,224	4,012,546	3,200,619
1904.....	434	4,101	4,342,225	2,554,214
<b>\$20,000 and less than \$100,000:</b>				
1909.....	300	9,037	13,432,870	6,391,272
1904.....	257	8,752	11,448,252	4,773,142
<b>\$100,000 and less than \$1,000,000:</b>				
1909.....	218	42,296	68,258,491	27,147,965
1904.....	151	33,375	44,511,158	16,224,657
<b>\$1,000,000 and over:</b>				
1909.....	17	15,016	24,887,604	8,897,432
1904.....	13	11,698	17,817,606	4,984,273
<b>Per cent of total:</b>				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
<b>Less than \$5,000:</b>				
1909.....	43.8	3.4	1.5	2.7
1904.....	38.9	2.4	1.6	3.0
<b>\$5,000 and less than \$20,000:</b>				
1909.....	27.3	5.8	4.3	6.8
1904.....	31.0	7.0	5.5	8.7
<b>\$20,000 and less than \$100,000:</b>				
1909.....	16.2	12.4	11.9	13.0
1904.....	18.4	14.7	14.4	16.2
<b>\$100,000 and less than \$1,000,000:</b>				
1909.....	11.8	57.9	60.3	57.9
1904.....	10.8	56.1	56.1	55.2
<b>\$1,000,000 and over:</b>				
1909.....	0.9	20.6	22.0	19.0
1904.....	0.9	19.7	22.4	16.9
<b>Average per establishment:</b>				
1909.....		39	\$61,077	\$25,289
1904.....		42	56,738	21,020
<b>Bread and other bakery products, 1909:</b>				
Less than \$5,000.....	63	369	\$1,099,920	\$376,006
\$5,000 and less than \$20,000.....	29	20	57,714	23,235
\$20,000 and less than \$100,000.....	32	113	292,004	118,130
\$100,000 and less than \$1,000,000.....	11	236	750,202	234,045
<b>Per cent of total:</b>				
Less than \$5,000.....	100.0	100.0	100.0	100.0
\$5,000 and less than \$20,000.....	31.7	5.4	5.2	6.2
\$20,000 and less than \$100,000.....	50.8	30.6	28.5	31.4
\$100,000 and less than \$1,000,000.....	17.5	64.0	68.2	62.4
<b>Average per establishment:</b>				
1909.....		6	\$17,459	\$5,968
<b>Lumber and timber products, 1909:</b>				
Less than \$5,000.....	851	14,604	\$13,140,886	\$9,159,418
\$5,000 and less than \$20,000.....	611	1,850	1,004,030	773,527
\$20,000 and less than \$100,000.....	218	2,450	2,189,287	1,506,641
\$100,000 and less than \$1,000,000.....	67	4,408	4,231,227	2,790,490
\$1,000,000 and less than \$1,000,000.....	25	5,818	5,719,342	3,998,760
<b>Per cent of total:</b>				
Less than \$5,000.....	100.0	100.0	100.0	100.0
\$5,000 and less than \$20,000.....	60.0	12.7	7.0	8.4
\$20,000 and less than \$100,000.....	25.6	10.8	16.7	17.4
\$100,000 and less than \$1,000,000.....	11.4	30.6	32.2	30.5
\$1,000,000 and less than \$1,000,000.....	2.9	30.8	43.5	43.7
<b>Average per establishment:</b>				
1909.....		17	\$16,442	\$10,763
<b>Oil, cottonseed, and cake, 1909:</b>				
\$5,000 and less than \$20,000.....	103	1,765	\$10,902,035	\$2,183,400
\$20,000 and less than \$100,000.....	8	21	98,815	22,596
\$100,000 and less than \$1,000,000.....	61	578	3,108,340	671,225
\$1,000,000 and less than \$1,000,000.....	34	1,160	7,005,780	1,489,579
<b>Per cent of total:</b>				
\$5,000 and less than \$20,000.....	100.0	100.0	100.0	100.0
\$20,000 and less than \$100,000.....	7.8	1.2	0.9	1.0
\$100,000 and less than \$1,000,000.....	59.2	32.7	28.5	30.7
\$1,000,000 and less than \$1,000,000.....	33.0	66.1	70.6	68.2
<b>Average per establishment:</b>				
1909.....		17	\$166,354	\$21,198
<b>Printing and publishing, 1909:</b>				
Less than \$5,000.....	161	834	\$1,600,591	\$1,260,672
\$5,000 and less than \$20,000.....	80	174	213,894	169,898
\$20,000 and less than \$100,000.....	59	314	513,754	407,790
\$100,000 and less than \$1,000,000.....	10	181	356,068	289,930
\$1,000,000 and less than \$1,000,000.....	3	165	511,937	393,054
<b>Per cent of total:</b>				
Less than \$5,000.....	100.0	100.0	100.0	100.0
\$5,000 and less than \$20,000.....	56.3	20.9	13.4	13.5
\$20,000 and less than \$100,000.....	36.6	37.0	32.4	32.3
\$100,000 and less than \$1,000,000.....	6.2	21.7	22.2	23.0
\$1,000,000 and less than \$1,000,000.....	1.9	10.8	32.0	31.2
<b>Average per establishment:</b>				
1909.....		5	\$9,942	\$7,830

<sup>1</sup> Includes the group "\$100,000 and less than \$1,000,000."

<sup>2</sup> Includes the group "\$1,000,000 and over."

<sup>3</sup> Includes the group "Less than \$5,000."

This table shows that, in 1909, of the 1,854 establishments only 17, or nine-tenths of 1 per cent, had a value of products exceeding \$1,000,000. These 17 establishments, of which 16 were cotton mills, gave

employment to an average of 15,016 wage earners, or 20.6 per cent of the total number in all establishments, and reported 22 per cent of the total value of products and 19 per cent of the total value added by manufacture.

On the other hand, the very small establishments—that is, those having a value of products of less than \$5,000—constituted a considerable proportion (43.8 per cent) of the total number of establishments, but the value of their products amounted to only 1.5 per cent of the total. The great bulk of manufacturing was carried on in establishments having a value of products of not less than \$100,000.

Comparison between the two censuses shows a slight increase in the proportion of business done by establishments reporting products valued at \$100,000 or more.

The fact that the average value of products per establishment increased from \$56,738 to \$61,077, and the value added by manufacture from \$21,020 to \$25,289, can not be taken as in itself indicating a tendency toward concentration. The increased values shown may be, and probably are, due in part to the increase that has taken place in the prices of commodities. The average number of wage earners per establishment decreased three. This table shows further that when the size of establishments is measured by value of products the bakery, lumber, and printing and publishing industries are composed almost entirely of establishments in which the value of products is less than \$100,000, while one-third of the establishments engaged in the manufacture of cottonseed oil have a value of products in excess of \$100,000 each.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The next table shows, for 1909, such a classification for all industries combined and for 11 important industries individually, and gives not only the number of establishments falling in each group but also the average number of wage earners employed.

The per cent distribution of the number of establishments is not shown in this table, but of the 1,854 establishments reported for all industries, 3.2 per cent employed no wage earners; 48.9 per cent, from 1 to 5 wage earners; 27.2 per cent, from 6 to 20; 7.6 per cent, from 21 to 50; and 13.1 per cent, 51 and over. The most numerous single group consists of the 907 establishments employing from 1 to 5 wage earners, and the next of the 504 establishments employing from 6 to 20 wage earners. There were 77 establishments that employed over 250 wage earners, 4 of which employed over 1,000, 3 of the latter being cotton mills and 1 a lumber mill.

Of the total number of wage earners, 54.3 per cent were in establishments employing over 250 wage

earners. The single group of establishments having the largest number of employees was the one employing from 501 to 1,000; this group employed 17,281 wage earners, or 23.7 per cent of the total. In four of the seven industries listed in this table but not in the

preceding one, namely, the steam-railroad repair shops, the fertilizer, the cotton-goods, and the hosiery and knit goods industries, comparatively large establishments do most of the business, as appears from the classification according to the number of wage earners.

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All industries.....	1,854	60	907	504	141	68	97	48	25	4
Bread and other bakery products.....	63	6	43	12	7	2	1			
Brick and tile.....	45		16	17		4				
Cars and general shop construction and repairs by steam-railroad companies.....	10		1	1	2	3		3		
Cotton goods, including cotton small wares.....	147		1	4	6	13	60	35	25	3
Fertilizers.....	26		6	3	2	8	7			
Foundry and machine-shop products.....	34	3	14	9	7	1				
Hosiery and knit goods.....	7		1	1	2	1	2	1		
Lumber and timber products.....	851	6	461	274	58	22	23	6		1
Oil, cottonseed, and cake.....	103		28	47	25	2	1			
Printing and publishing.....	101	19	105	32	3	2				
Turpentine and rosin.....	50	3	27	19	7					
All other industries.....	351	23	205	85	22	10	3	3		
AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	73,046		2,550	5,440	4,370	5,024	16,059	17,057	17,281	5,265
Bread and other bakery products.....	369		113	30		166				
Brick and tile.....	888		44	204	236	274	130			
Cars and general shop construction and repairs by steam-railroad companies.....	1,418		4	6	86	189		1,133		
Cotton goods, including cotton small wares.....	45,454		4	47	202	906	10,738	12,639	17,281	3,637
Fertilizers.....	1,851		23	35	63	599	1,131			
Foundry and machine-shop products.....	417		35	127	187	68				
Hosiery and knit goods.....	839			19	53	87	286	394		
Lumber and timber products.....	14,604		1,355	2,044	1,839	1,621	3,274	1,943		1,628
Oil, cottonseed, and cake.....	1,765		101	587	791	181	105			
Printing and publishing.....	834		293	287	107	147				
Turpentine and rosin.....	443		50	198	195					
All other industries.....	4,164		528	896	611	786	395	948		
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	100.0		3.5	7.4	6.0	6.9	22.0	23.4	23.7	7.2
Bread and other bakery products.....	100.0		30.6	24.4		45.0				
Brick and tile.....	100.0		5.0	23.0	26.6	30.9	14.6			
Cars and general shop construction and repairs by steam-railroad companies.....	100.0		0.3	0.4	6.1	13.3		79.9		
Cotton goods, including cotton small wares.....	100.0		(1)	0.1	0.4	2.0	23.6	27.8	38.0	8.0
Fertilizers.....	100.0		1.2	1.9	3.4	32.4	61.1			
Foundry and machine-shop products.....	100.0		8.4	30.5	44.8	16.3				
Hosiery and knit goods.....	100.0			2.3	6.3	10.4	34.1	47.0		
Lumber and timber products.....	100.0		9.3	20.2	12.6	11.1	22.4	13.3		11.1
Oil, cottonseed, and cake.....	100.0		5.7	33.3	44.8	10.3	5.9			
Printing and publishing.....	100.0		35.1	34.4	12.8	17.0				
Turpentine and rosin.....	100.0		11.3	44.7	44.0					
All other industries.....	100.0		12.7	21.5	14.7	18.0	9.5	22.8		

<sup>1</sup> Less than one-tenth of 1 per cent.

**Expenses.**—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses which make up the total.

The table following shows in percentages, for 1909, the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II.

This table shows that, for all industries combined, 68.1 per cent of the total expenses was incurred for materials, 24.8 per cent for services, that is, salaries and wages, and 7.1 per cent for other purposes. As would be expected, these proportions vary greatly in the different industries.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries.....	3.9	20.9	68.1	7.1
Bread and other bakery products.....	4.3	12.9	78.7	4.1
Brick and tile.....	6.3	39.7	45.7	8.2
Cars and general shop construction and repairs by steam-railroad companies.....	4.1	45.8	49.8	0.3
Cotton goods, including cotton small wares.....	2.5	20.2	71.7	5.5
Fertilizers.....	4.5	8.0	74.4	12.3
Foundry and machine-shop products.....	10.1	43.7	40.1	6.1
Hosiery and knit goods.....	4.5	26.3	57.0	11.3
Lumber and timber products.....	7.0	42.0	39.0	11.2
Oil, cottonseed, and cake.....	3.3	4.7	87.1	4.0
Printing and publishing.....	19.0	34.1	28.2	18.7
Turpentine and rosin.....	2.9	33.2	54.0	9.8
All other industries.....	7.2	20.0	61.7	11.0

**Engines and power.**—The following table shows, for all industries combined, the number of engines or other motors, according to their character, employed

in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 <sup>1</sup>	1909	1904	1899 <sup>1</sup>	1909	1904	1899
<b>Primary power, total.....</b>	<b>3,140</b>	<b>1,578</b>	<b>1,333</b>	<b>276,378</b>	<b>197,479</b>	<b>112,697</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Owned.....	2,080	1,578	1,333	235,213	188,948	109,192	85.1	95.7	96.9
Steam.....	1,806	1,309	1,174	193,052	157,432	80,913	69.9	79.7	71.8
Gas.....	153	55	29	1,204	239	323	0.5	0.1	0.3
Water wheels.....	125	123	130	38,422	31,094	27,586	13.9	15.7	24.5
Water motors.....	5	1	( <sup>2</sup> )	75	3	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Other.....				2,400	180	370	0.9	0.1	0.3
Rented.....	1,051	( <sup>2</sup> )	( <sup>2</sup> )	41,165	8,531	3,505	14.9	4.3	3.1
Electric.....	1,051	( <sup>2</sup> )	( <sup>2</sup> )	41,130	8,451	185	14.9	4.3	0.2
Other.....				35	80	3,320	( <sup>2</sup> )	( <sup>2</sup> )	2.9
<b>Electric motors</b>	<b>1,502</b>	<b>268</b>	<b>124</b>	<b>67,620</b>	<b>32,162</b>	<b>6,061</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Run by current generated by establishment.....	451	268	124	26,490	23,711	5,876	39.2	73.7	96.9
Run by rented power.....	1,051	( <sup>2</sup> )	( <sup>2</sup> )	41,130	8,451	185	60.8	26.3	3.1

<sup>1</sup> Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.  
<sup>2</sup> Not reported.  
<sup>3</sup> Less than one-tenth of 1 per cent.

This table indicates that the increase in primary power during the last decade was general in all of the different forms. In 1909 as in 1904 steam formed the major part of the power; but notwithstanding an increase during this period of 35,620 horsepower, the proportion of this kind of power decreased from 79.7 per cent in 1904 to 69.9 per cent in 1909. The more general use of gas engines is shown, the number of such engines being 153 with 1,264 horsepower in 1909, as against 55 with 239 horsepower in 1904 and 29 with 323 horsepower in 1899. The figures also show that the practice of renting power is decidedly on the

increase, particularly from 1904 to 1909, as 41,165 horsepower was rented in 1909, as against only 8,531 in 1904 and 3,505 in 1899. This increase is in rented electric power and is due to the rapid development of the abundant water power of the state through central power stations that generate electricity and transmit it over a wide area, thereby furnishing a better and cheaper power for manufactures. The use of electric motors for the purpose of applying the power generated within the establishments is also shown to be rapidly increasing, the horsepower of such motors having increased from 5,876 in 1899 to 23,711 in 1904 and 26,490 in 1909.

**Fuel.**—Closely related to the question of kind of power employed is that of the fuel consumed in generating this power, or otherwise used as material in the manufacturing processes. The following table shows the quantity of each kind of fuel used in 1909, by totals for all industries combined and for certain selected industries:

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gasoline (barrels).	Gas (1,000 feet).
<b>All industries<sup>1</sup>.....</b>	<b>9,314</b>	<b>675,653</b>	<b>4,444</b>	<b>140,208</b>	<b>8,805</b>	<b>1,448</b>
Bread and other bakery products.....	388	662	244	2,811	17	711
Brick and tile.....		30,642		44,240	134	
Cars and general shop construction and repairs by steam-railroad companies.....		9,280	24		12	
Cotton goods, including cotton small wares.....	7,270	428,523		21,282	270	
Fertilizers.....		45,046		986	27	
Foundry and machine-shop products.....	67	2,094	1,331	1,317	120	
Gas, illuminating and heating.....		20,609	1,350		6,624	
Hosiery and knit goods.....		3,087		1,148		
Lumber and timber products.....		7,287	50	5,063	100	
Oil, cottonseed, and cake.....	1,232	62,119	800	30,475	8	
Printing and publishing.....	200	499		208	320	494
Turpentine and rosin.....				2,797	1	
All other industries.....	157	59,706	645	10,081	1,151	243

<sup>1</sup> In addition there were 45 tons of other varieties of fuel reported.

**SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.**

(With statistics for laundries and custom sawmills and gristmills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and value of materials and products and the number and kind of machines used in manufactures which do not appear on the general schedule. Certain data of this character for six important industries in South Carolina are here presented.

**Cotton goods, including cotton small wares.**—The cotton-goods industry has been the most important factor in the development of manufactures in South Carolina. Its history in the state dates beyond 1839-40 when 15 establishments were reported, employing an average of 570 wage earners and turning out products valued at \$359,000. Beginning about 1869 the industry developed rapidly and became more firmly established on a factory basis. During the decade beginning in that year the value of products nearly dou-

bled, while from 1879-80 to 1889-90, the period of greatest relative growth, the increase was 238.5 per cent. From 1889-90 to 1899 the value of products increased 203.3 per cent.

The quantity and cost of materials used, by kind, in 1909, 1904, and 1899, are given below:

MATERIAL.	1909	1904	1899
<b>Total cost.....</b>	<b>\$41,303,438</b>	<b>\$34,308,311</b>	<b>\$17,263,882</b>
<b>Cotton:</b>			
Domestic—			
Pounds.....	322,945,571	269,045,002	220,899,760
Cost.....	\$35,284,141	\$30,451,159	\$14,909,520
Foreign—			
Pounds.....	1,440,207	1,912,459	154,047
Cost.....	\$240,068	\$318,020	\$20,026
<b>Cotton yarns purchased:</b>			
Pounds.....	487,186	636,300	2,866,925
Cost.....	\$89,706	\$110,055	\$365,106
Starch.....	\$359,679	\$209,646	\$115,050
Chemicals and dyestuffs.....	\$187,157	\$93,007	\$50,707
Fuel and rent of power and heat.....	\$1,977,599	\$1,573,054	\$611,202
All other materials.....	\$3,156,088	\$1,553,370	\$1,191,365

The cotton consumed in this industry in 1909 amounted to 324,385,778 pounds, which cost \$35,533,209, representing an increase of 53,428,317 pounds, or 19.7 per cent, over the quantity consumed in 1904, and an increase of \$4,764,030, or 15.5 per cent, in the cost. This represents an increase in the consumption of domestic cotton alone, the foreign cotton used in 1909 amounting to only 1,440,207 pounds, as compared with 1,912,459 pounds in 1904, although from 1899 to 1904 the consumption of foreign cotton increased greatly. The great increase in the cost of cotton per pound from 1899 to 1904, and the very slight change in this respect from 1904 to 1909, are conspicuous features of the table. There has been a material decrease in the quantity of cotton yarns purchased, which indicates a decided tendency among manufacturers to spin their own yarn. Expenditures for all the remaining materials for which separate totals are shown increased from 1899 to 1904, as well as from 1904 to 1909.

The following is a statement of the products reported for the industry at the last three censuses:

PRODUCT.	1909	1904	1899
<b>Total value</b> .....	<b>\$65,929,555</b>	<b>\$49,437,644</b>	<b>\$29,723,919</b>
Plain cloth for printing or converting:			
Square yards.....	561,861,267	414,491,743	175,191,634
Value.....	\$29,848,377	\$17,425,723	\$6,205,073
Brown or bleached sheetings or shirtings:			
Square yards.....	302,763,414	276,078,497	283,105,383
Value.....	\$15,914,158	\$13,249,090	\$11,553,073
Twills and sateens:			
Square yards.....	12,910,370	17,910,405	11,379,712
Value.....	\$797,624	\$962,409	\$485,484
Fancy woven fabrics:			
Square yards.....	50,893,070	17,781,844	213,068
Value.....	\$2,981,306	\$975,998	\$14,000
Ginghams:			
Square yards.....	29,417,246	25,212,195	16,752,808
Value.....	\$1,525,286	\$1,376,908	\$806,551
Drills:			
Square yards.....	75,828,918	88,551,799	116,467,224
Value.....	\$5,062,204	\$5,344,146	\$5,375,017
Ticks, denims, and stripes:			
Square yards.....	8,582,717	6,533,888	1,802,138
Value.....	\$808,407	\$444,977	\$139,131
Bags and bagging:			
Square yards.....	19,792,444	14,250,913	229,100
Value.....	\$1,120,825	\$683,877	\$29,984
Yarns for sale:			
Pounds.....	32,709,732	31,645,397	24,859,616
Value.....	\$6,759,913	\$5,217,795	\$3,461,090
Cotton waste for sale:			
Pounds.....	20,621,480	24,199,029	25,582,434
Value.....	\$850,246	\$867,273	\$433,986
All other products.....	\$3,261,239	\$1,889,442	\$1,228,930

In 1899 brown or bleached sheetings or shirtings, valued at \$11,553,073, was the leading class of products, but in 1904 and 1909 these products became secondary to the manufacture of plain cloth for printing or converting. The value of plain cloth formed 40.7 per cent in 1909, 35.2 per cent in 1904, and 20.9 per cent in 1899, of the total value of all products reported for the entire industry at the three censuses.

The largest proportional increases shown are in the quantity and value of fancy woven fabrics. From 1899 to 1904 the quantity multiplied over eighty-three times and the value nearly seventy times, while from 1904 to 1909 the gain in quantity was 186.2 per cent and the gain in value 205.5 per cent. The output of

brown or bleached sheetings and shirtings, gingham, ticks, denims, and stripes, bags and bagging, and yarns for sale had a greater value in 1909 than in 1904, while the value of twills and sateens, drills, and cotton waste for sale was less.

The growth of this industry is clearly indicated by the increase in the number of producing spindles and looms. The number of active spindles reported by the cotton mills of the state was 3,754,251 in 1909, 2,864,092 in 1904, and 1,431,349 in 1899, an increase in 1909 over 1904 of 890,159, or 31.1 per cent, and an increase in 1904 over 1899 of 1,432,743, or 100.1 per cent. During the period from 1904 to 1909 the number of looms increased from 72,702 to 94,205, a gain of 21,503, or 29.6 per cent, while from 1899 to 1904 the number increased from 42,663 to 72,702, a gain of 30,039, or 70.4 per cent.

**Lumber and timber products.**—Lumbering has long been an important industry in South Carolina. As early as 1849–50 there were 353 establishments reported, with a total value of products amounting to \$1,108,880.

The following is a statement of the quantities of the principal products reported for the sawmills at the censuses of 1909 and 1899:

PRODUCT.	QUANTITY.	
	1909	1899
Rough lumber..... M feet, b. m. . . . .	897,660	469,429
Shingles..... thousands..	122,709	88,878
Lath..... thousands..	28,303	26,311

From 1899 to 1909 there was an increase of 92.5 per cent in the production of rough lumber, 38.1 per cent in shingles, and 7.6 per cent in lath. Yellow pine was the principal species of timber cut in 1909, with 797,094 M feet board measure, or 88.8 per cent of the total cut of rough lumber. Cypress was second in importance, with 36,040 M feet, or 4 per cent of the total cut. Chief among the other species cut were red gum, spruce, oak, and yellow poplar.

**Oil, cottonseed, and cake.**—The growth and importance of this industry in the state is remarkable. As late as 1880 cotton seed was used as fertilizer and as feed, or was treated as waste; soon after three cottonseed crushing mills were in operation in the state. At the census of 1889–90, 17 establishments were reported, with products valued at \$927,772.

The following statement shows the quantity and cost of cotton seed crushed and the quantity and value of crude products, by kind, in 1909, 1904, and 1899:

MATERIAL OR PRODUCT.	QUANTITY.		
	1909	1904	1899
Cotton seed crushed..... tons..	346,550	213,103	156,642
Crude products, manufactured:			
Oil..... gallons..	15,745,552	9,178,661	6,162,218
Meal and cake..... tons..	156,729	90,815	57,986
Hulls..... tons..	108,795	71,942	71,642
Linters..... pounds..	14,356,160	6,641,405	3,223,892

The totals presented include all cotton seed crushed, whether by establishments where the exclusive or chief products were those obtained from cotton seed, or by such mills as were primarily engaged in the manufacture of other products but incidentally crushed some cotton seed. Furthermore, the crude products reported represent the total production derived from crushing cotton seed, whether sold as such or used as intermediate products in further processes of manufacture, such as the refining of oil and the mixing of fertilizer and feed.

Of the 102 cottonseed-oil mills reported in 1909 as crushing seed, 23 crushed less than 1,000 tons each during the census year; 28 crushed 1,000 but less than 2,000 tons; 32 crushed 2,000 but less than 5,000 tons; 13 crushed 5,000 but less than 10,000 tons; 4 crushed 10,000 but less than 20,000 tons; and 2 crushed 20,000 tons or over.

In 1909 the ratios which the several products bore to the total weight of the seed when received at the mill were: crude oil, 17 per cent; meal and cake, 45.2 per cent; hulls, 30 per cent; and linters, 2.1 per cent; whereas in 1904 the proportions were: crude oil, 16.2 per cent; meal and cake, 42.6 per cent; hulls, 33.8 per cent; and linters, 1.6 per cent. It is interesting to note that from 1899 to 1909 there was an increase of 2.2 in the percentage of oil and 8.2 in that for meal and cake, while in the percentage of hulls there was a decrease of 15.7.

**Fertilizers.**—The principal products manufactured during 1909, 1904, and 1899, by kind, quantity, and value, are shown in the following statement:

PRODUCT.	1900	1904	1899
<b>Total value.....</b>	<b>\$9,024,900</b>	<b>\$8,637,576</b>	<b>\$4,882,506</b>
Superphosphates from minerals, bones, etc.:			
Tons.....	176,005	49,763	173,183
Value.....	\$2,036,220	\$453,603	\$1,404,560
Ammoniated fertilizers:			
Tons.....	41,086	90,324	.....
Value.....	\$872,025	\$1,415,402	.....
Concentrated phosphate:			
Tons.....	2,771	.....	.....
Value.....	\$74,767	.....	.....
Complete fertilizers:			
Tons.....	237,208	57,230	207,860
Value.....	\$4,943,473	\$980,203	\$3,146,915
Other fertilizers:			
Tons.....	55,044	57,091	7,497
Value.....	\$801,827	\$648,739	\$105,324
Sulphuric acid for sale:			
Tons.....	11,839	4,320	41,036
Value.....	\$67,954	\$51,864	\$225,698
Other acids:			
Tons.....	12,836	.....	.....
Value.....	\$159,342	.....	.....
All other products.....	\$60,292	\$87,585	.....

The statistics presented in this table pertain to the establishments primarily engaged in fertilizer production. There were, however, considerable quantities incidentally manufactured in 1909 by cottonseed-oil mills, amounting to 19,635 tons, which were valued at \$392,922.

The quantity of all kinds of fertilizers shown in the above table was 512,714 tons in 1909, compared with 254,408 tons in 1904 and 388,540 tons in 1899, a gain

of 258,306 tons in 1909 over 1904 and a decrease of 134,132 tons in 1904, compared with 1899. Complete fertilizers was the most important product in 1909 and 1899, while ammoniated fertilizers was the chief product in 1904. From 1904 to 1909 the quantity of complete fertilizers increased more than threefold, and superphosphates more than twofold. During the same period ammoniated fertilizers and other fertilizers decreased 53.8 per cent and 3.6 per cent, respectively. The principal materials used by fertilizer establishments in 1909 consisted of 188,234 tons of phosphate rock, 80,653 tons of pyrites, and 50,669 tons of ammoniates, and in 1904 of 92,108 tons of phosphate rock, 42,670 tons of pyrites, and about 14,300 tons of ammoniates. In addition to the products shown in the above table, 237,188 tons of acid phosphate, 165,509 tons of sulphuric acid, and 25,420 tons of other products were manufactured during 1909 by the 26 establishments reporting, but were consumed by the same establishments in which they were manufactured in further processes.

**Printing and publishing.**—The following tabular statement shows the number of different newspapers and periodicals published and the average circulation per issue of each for the census years 1909, 1904, and 1899:

PERIOD OF ISSUE.	NUMBER OF PUBLICATIONS.			AGGREGATE CIRCULATION PER ISSUE.		
	1909	1904	1899	1909	1904	1899
<b>Total.....</b>	<b>138</b>	<b>148</b>	<b>190</b>	<b>278,512</b>	<b>239,988</b>	<b>161,988</b>
Daily.....	13	14	7	51,624	32,193	18,850
Sunday.....	4	6	3	32,447	24,617	( <sup>1</sup> )
Semiweekly.....	221	16	216	44,622	28,401	23,527
Weekly.....	90	103	83	133,240	137,430	110,111
Monthly.....	8	6	10	10,504	7,018	8,000
All other classes.....	2	3	1	6,075	9,400	1,590

<sup>1</sup> Included in circulation for daily.    <sup>2</sup> Includes one triweekly publication.

With the exception of semiweeklies and monthlies, each of the different classes of publications decreased in number in 1909, as compared with 1904; the greatest decline being in the weeklies. Only the weeklies and the publications included under the head of "All other classes" decreased in circulation from 1904 to 1909. The greatest gain in circulation was made by the daily publications. In 1904 the circulation of this class was 32,193, an increase of 13,343, or 70.8 per cent, over 1899. By 1909 the circulation had reached 51,624, a gain of 19,431, or 60.4 per cent, over 1904. In 1909, 5 of the 13 daily papers were morning editions, with an aggregate circulation per issue of 33,115. All of the publications reported were published in the English language, except one weekly, which was in German.

**Turpentine and rosin.**—As early as 1849-50 there were 40 establishments in the state reported as engaged in this industry, having products valued at \$235,836. The industry increased until 1879-80, when 192 establishments were reported, with a product valued at

\$1,893,206. Since that census there has been a steady decline of the industry, because of the gradual depletion of the pine forests of the state.

The quantity and value of products, by classes, for 1909, 1904, and 1899 are given below:

PRODUCT.	1909	1904	1899
Total value.....	\$406,286	\$574,150	\$787,656
Spirits of turpentine:			
Gallons.....	460,186	704,412	1,508,019
Value.....	\$205,517	\$370,040	\$563,445
Rosin:			
Barrels (280 pounds).....	51,401	87,836	129,013
Value.....	\$199,273	\$203,749	\$183,528
All other products.....	\$1,496	\$355	\$40,683

The working unit in turpentine operations is called a "crop," which consists of 10,500 boxes or cups. In 1909 there were 271 crops produced in the state, of which 42 were from virgin trees; 41 from yearling or second-year trees; 91 from third-year trees; and 97 from older trees. It is an interesting fact that no establishments in the state report the treatment of trees through the new cup system, but universally employed the comparatively crude and wasteful box method.

Laundries.—Statistics for steam laundries are not included in the general tables or in the totals for manufacturing industries. In 1909 there were 24 such establishments in South Carolina, 3 of which were in Charleston, 3 in Greenville, 2 in Columbia, and 2 in Spartanburg. The following statement summarizes the statistics:

Number of establishments.....	24
Persons engaged in the industry.....	440
Proprietors and firm members.....	26
Salaried employees.....	41
Wage earners (average number).....	373
Primary horsepower.....	501
Capital.....	\$183,975
Expenses.....	207,717
Services.....	117,772
Materials.....	51,765
Miscellaneous.....	38,180
Amount received for work done.....	269,112

In respect to form of organization, the establishments are evenly distributed, eight establishments each being reported as under individual, firm, and corporate ownership, respectively. Seven establishments reported receipts for the year of less than \$5,000; 12 reported receipts of between \$5,000 and \$20,000; and 5 reported receipts of between \$20,000 and \$100,000.

The number of wage earners employed each month and the per cent which this number represented of the greatest number employed in any month are shown in the next table.

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	362	92.3	July.....	302	100.0
February.....	355	93.1	August.....	301	92.1
March.....	373	95.2	September.....	304	92.9
April.....	376	95.9	October.....	379	106.7
May.....	373	95.2	November.....	386	98.5
June.....	380	96.9	December.....	306	93.4

The different kinds of primary power, the number of engines or motors, and the amount of horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines or motors.	Horsepower.
Primary power, total.....		501
Owned—Steam.....	23	450
Rented—Electric.....	5	51

The kind and amount of fuel used are shown in the statement following.

KIND.	Unit.	Quantity.
Bituminous coal.....	Tons.....	4,575
Coke.....	Tons.....	50
Wood.....	Cords.....	1,095
Oil.....	Barrels.....	48
Gas.....	1,000 feet.....	538

Custom sawmills and gristmills.—Statistics for custom sawmills and gristmills are not included in the general tables or in the totals for manufacturing industries, but are presented in the following summary:

	Custom sawmills.	Custom gristmills.
Number of establishments.....	73	378
Persons engaged in industry.....	271	808
Proprietors and firm members.....	100	441
Salaried employees.....	1	4
Wage earners (average number).....	170	363
Primary horsepower.....	1,358	7,272
Capital.....	\$60,358	\$488,198
Expenses.....	32,225	1,203,305
Services.....	25,847	37,045
Materials.....	1,745	1,153,308
Miscellaneous.....	4,633	12,862
Value of products.....	62,273	1,325,931

<sup>1</sup> Includes estimate of all grain ground. A similar estimate for value of lumber sawed by custom sawmills is impracticable.

STATISTICS OF MANUFACTURES—SOUTH CAROLINA.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.  
THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Cen- sus.	Num- ber of estab- lish- ments.	PERSONS ENGAGED IN INDUSTRY.				Pri- mary horse- power.	Capital.	Sala- ries.	Wages.	Cost of mate- rials.	Value of prod- ucts.	Value added by manu- fac- ture.
			Total.	Pro- pri- etors and firm mem- bers.	Sala- ried em- ploy- ees.	Wage earn- ers (aver- age num- ber).							
Expressed in thousands.													
<b>STATE—All industries</b> .....	<b>1909</b>	<b>1,854</b>	<b>78,040</b>	<b>1,787</b>	<b>3,257</b>	<b>73,048</b>	<b>276,378</b>	<b>\$178,221</b>	<b>\$3,756</b>	<b>\$20,361</b>	<b>\$66,851</b>	<b>\$113,236</b>	<b>\$46,885</b>
	<b>1904</b>	<b>1,399</b>	<b>63,071</b>	<b>1,241</b>	<b>2,389</b>	<b>59,441</b>	<b>197,479</b>	<b>118,422</b>	<b>2,355</b>	<b>13,669</b>	<b>49,969</b>	<b>79,376</b>	<b>29,407</b>
	<b>1899</b>	<b>1,369</b>	<b>63,071</b>	<b>1,241</b>	<b>1,419</b>	<b>47,025</b>	<b>112,697</b>	<b>62,760</b>	<b>1,308</b>	<b>8,130</b>	<b>30,486</b>	<b>53,336</b>	<b>22,860</b>
Bread and other bakery products.....	1909	63	521	65	87	369	218	394	39	119	724	1,100	376
	1904	52	397	57	29	311	132	278	19	99	370	618	248
	1899	35	312	39	27	246	.....	285	12	76	323	325	202
Brick and tile.....	1909	45	990	50	52	888	2,824	935	37	233	268	731	463
	1904	47	903	52	36	875	2,531	517	20	184	177	656	479
	1899	76	1,293	107	41	1,145	2,342	341	20	241	132	573	441
Canning and preserving.....	1909	15	495	14	14	467	95	280	19	64	159	318	159
	1904	14	1,080	16	20	1,044	287	202	14	112	349	574	225
	1899	14	.....	.....	7	126	.....	36	1	13	20	51	31
Carriages and wagons and materials.....	1909	23	317	25	20	272	272	453	25	104	244	464	220
	1904	38	404	42	10	346	320	502	20	118	290	548	258
	1899	56	.....	.....	14	340	.....	314	12	91	206	414	208
Cars and general shop construction and repairs by steam-railroad companies.....	1909	10	1,433	.....	65	1,418	1,029	518	62	687	746	1,499	753
	1904	8	1,222	.....	91	1,131	510	300	64	577	433	1,081	648
	1899	6	803	.....	27	776	413	355	21	363	204	691	397
Clothing, men's, including shirts.....	1909	5	115	1	15	99	39	113	11	20	94	139	45
	1904	5	138	4	9	125	18	54	4	25	76	137	61
	1899	5	195	7	12	170	10	128	5	37	187	306	119
Coffins, burial cases, and undertakers' goods.....	1909	4	90	3	10	77	285	130	9	27	62	127	65
	1904	3	104	.....	12	92	125	156	8	25	38	126	88
	1899	3	66	4	4	58	.....	72	4	14	33	64	31
Copper, tin, and sheet-iron products.....	1909	8	92	8	5	79	54	100	3	35	106	200	94
	1904	5	27	2	1	24	10	24	1	15	13	40	27
	1899	8	.....	.....	7	56	.....	30	4	24	66	116	61
Cotton goods, including cotton small wares.....	1909	147	46,342	3	885	45,454	187,716	125,549	1,460	11,661 <sup>6</sup>	41,303	65,930	24,627
	1904	127	38,038	6	761	37,271	133,397	82,337	1,008	7,702	34,308	40,438	15,130
	1899	80	30,621	5	415	30,201	73,042	39,259	537	5,007	17,264	20,724	12,400
Fertilizers.....	1909	26	2,057	2	204	1,851	4,766	11,857	338	671	5,629	9,025	3,396
	1904	20	1,221	1	149	1,071	4,286	7,087	153	304	2,692	3,638	946
	1899	22	1,862	5	85	1,772	3,940	10,565	165	479	3,108	4,883	1,775
Flour-mill and gristmill products.....	1909	10	44	9	12	23	406	110	7	7	308	351	43
	1904	29	103	29	14	60	1,440	206	7	18	633	725	92
	1899	26	.....	.....	18	94	.....	205	8	25	734	869	135
Foundry and machine-shop products.....	1909	34	477	20	40	417	817	703	45	194	178	547	369
	1904	37	517	39	28	450	1,122	511	29	212	171	542	371
	1899	26	369	27	18	324	404	316	17	141	107	463	263
Gas, illuminating and heating.....	1909	12	163	1	35	127	207	1,431	34	52	114	334	220
	1904	4	124	.....	16	108	43	1,153	11	31	59	193	134
	1899	4	127	.....	23	104	33	961	12	30	38	172	134
Hosiery and knit goods.....	1909	7	864	3	22	839	597	755	26	152	334	655	321
	1904	14	1,103	5	40	1,058	890	824	30	187	586	1,079	493
	1899	6	377	3	15	359	501	345	14	71	238	392	154
Ice, manufactured.....	1909	32	287	22	47	218	2,964	1,041	44	85	129	433	301
	1904	18	144	8	25	111	1,835	712	23	45	75	244	169
	1899	13	93	7	13	73	1,074	407	10	24	37	116	79
Lumber and timber products.....	1909	851	16,330	1,042	684	14,604	49,400	15,010	713	4,378	3,981	13,141	9,160
	1904	502	11,654	621	392	10,641	29,490	8,194	347	2,873	2,506	8,279	5,773
	1899	519	.....	.....	274	7,117	.....	3,882	168	1,503	2,431	5,959	3,528
Marble and stone work.....	1909	36	315	41	38	236	142	218	30	120	144	426	282
	1904	18	51	9	3	39	2	39	2	15	28	67	39
	1899	11	.....	.....	10	137	.....	265	8	46	34	113	70
Mattresses and spring beds.....	1909	4	56	1	9	46	77	76	9	12	64	107	43
	1904	5	69	3	7	59	69	73	6	14	61	97	36
	1899	5	.....	.....	15	59	.....	62	9	13	58	115	57
Oil, cottonseed, and cake.....	1909	103	2,190	16	409	1,765	17,730	6,880	333	467	8,720	10,903	2,183
	1904	100	1,626	3	341	1,282	14,500	5,177	233	320	4,553	5,463	610
	1899	50	914	18	162	734	5,766	1,960	109	144	2,363	3,193	740
Printing and publishing.....	1909	161	1,294	171	289	834	603	1,664	230	412	340	1,601	1,261
	1904	150	985	161	201	623	293	945	152	268	214	1,038	824
	1899	120	834	125	84	625	.....	680	62	236	188	789	601
Turpentine and rosin.....	1909	56	524	63	18	443	2	120	9	101	164	400	242
	1904	79	265	87	9	169	9	92	4	37	374	574	200
	1899	132	1,093	171	36	886	.....	269	8	136	471	785	317
All other industries.....	1909	202	2,994	177	297	2,520	6,135	4,869	273	760	2,540	4,799	2,250
	1904	134	2,836	96	189	2,551	6,165	4,039	191	688	1,963	4,219	2,256
	1899	152	.....	.....	112	1,617	.....	2,064	102	353	2,095	3,170	1,075

<sup>1</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.  
<sup>2</sup> Excluding statistics for two establishments, to avoid disclosure of individual operations.

STATISTICS OF MANUFACTURES—SOUTH CAROLINA.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Cen- sus.	Num- ber of estab- lish- ments.	PERSONS ENGAGED IN INDUSTRY.				Pri- mary horse- power.	Capital.	Sala- ries.	Wages.	Cost of mate- rials.	Value of prod- ucts.	Value added by manu- fac- ture.
			Total.	Pro- pri- etors and firm mem- bers.	Sala- ried em- ploe- ees.	Wage earn- ers (Aver- age num- ber).							
Expressed in thousands.													
CHARLESTON—All Industries .....	1909	116	3,375	76	425	2,874	4,894	\$6,578	\$396	\$1,013	\$4,299	\$6,951	\$2,722
	1904	108	3,888	78	360	3,450		5,807	338	1,054	3,748	6,007	2,259
	1899	104			221	3,187		5,898	206	919	3,507	5,713	2,206
Bread and other bakery products.....	1909	20	342	20	69	253	137	264	31	81	505	750	245
	1904	23	306	27	27	252		221	18	83	276	457	182
	1899	25	267	29	26	212		246	12	65	290	403	173
Carriages and wagons and materials .....	1909	3	61	3	3	55	21	23	3	20	24	58	34
	1904	3	45	4	1	40		15	1	10	11	40	29
	1899												
Foundry and machine-shop products.....	1909	5	152	3	13	136	269	298	19	66	41	166	125
	1904	4	194	1	11	182		210	14	112	65	243	178
	1899	4	178	1	10	167		170	13	88	90	223	133
Ice, manufactured .....	1909	4	27	1	4	22	640	253	5	13	21	74	50
	1904	4	41		3	38		307	3	10	33	72	39
	1899												
Lumber and timber products.....	1909	9	364	3	37	324	898	454	38	100	277	497	220
	1904	8	405	7	29	369		455	35	98	202	404	202
	1899	10	272	7	20	246		322	18	86	208	404	196
Printing and publishing.....	1909	18	306	14	94	198	465	451	82	110	110	468	358
	1904	15	228	10	84	134		286	66	67	72	279	207
	1899	13	250	16	33	201		272	27	90	90	331	241
All other industries.....	1909	57	2,123	32	205	1,886	2,304	4,827	218	623	3,218	4,938	1,600
	1904	51	2,669	20	205	2,435		4,313	201	650	3,060	4,512	1,422
	1899	52			132	2,362		4,370	136	581	2,730	4,202	1,463

CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES COMBINED.

Columbia.....	1909	55	2,788	33	243	2,522	7,784	\$7,705	\$259	\$927	\$3,578	\$5,872	\$2,294
	1904	41	2,573	25	155	2,393		4,745	176	798	2,642	4,677	2,035
	1899	41			75	2,091		3,879	93	519	1,848	3,134	1,286
Greenville.....	1909	41	1,324	29	113	1,182	2,574	1,030	98	365	1,228	2,142	914
	1904	30	1,303	26	73	1,204		2,059	40	257	1,101	1,677	576
	1899	22			36	770		1,081	36	145	718	966	248
Spartanburg.....	1909	36	1,916	25	118	1,773	4,965	4,471	126	490	2,085	3,276	1,191
	1904	35	1,745	26	69	1,650		2,869	72	348	1,544	2,128	584
	1899	28			33	1,361		2,335	41	270	907	1,591	684

<sup>1</sup> Figures can not be shown without disclosing individual operations.

<sup>2</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Primary horse-power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners.			Total.	16 and over.		Under 16.				
					Male.	Female.	Average number.	Number.			Male.	Female.	Male.	Female.			
								Maximum month.	Minimum month.								
1 All industries.....	1,854	78,040	1,737	1,596	1,393	268	78,046	Mh 76,373	Je 70,283	(1)	(1)	(1)	(1)	(1)	276,378		
2 Agricultural implements.....	4	24	5	2	1	1	15	Ap 20	No 11	15	15				53		
3 Bread and other bakery products.....	63	521	65	21	32	34	369	No 391	Ja 353	373	296	46	23	8	218		
4 Brick and tile.....	45	999	50	39	9	4	888	Au 1,230	Fe 510	1,220	1,157				2,824		
5 Canning and preserving.....	15	495	14	11	2	1	467	Mh 974	Je 2	1,088	374	552	82	80	95		
6 Carriages and wagons and materials.....	23	317	25	9	8	3	272	De 291	Au 245	291	258	5	28		272		
7 Cars and general shop construction and repairs by steam-railroad companies.....	10	1,483		8	55	2	1,418	De 1,503	Fe 1,300	1,503	1,501	1	1		1,020		
8 Cars and general shop construction and repairs by street-railroad companies.....	4	45		4	3		38	Ap 39	Au 37	39	37	2			85		
9 Clothing, men's, including shirts.....	5	115	1	8	7		99	Se 137	Ja 65	131	21	108	1	1	30		
10 Coffins, burial cases, and undertakers' goods.....	4	90	3	2	7	1	77	Oc 89	Ja 64	88	88				285		
11 Confectionery.....	11	35	12	1			22	De 24	Fe 20	24	19	4	1		5		
12 Copper, tin, and sheet-iron products.....	8	92	8	1	1		79	Je 90	No 74	77	75		2		54		
13 Cotton goods, including cotton small wares.....	147	46,342	3	443	370	72	45,454	Jy 46,300	Ja 44,669	46,065	26,063	11,386	4,843	3,773	187,716		
14 Fertilizers.....	26	2,057	2	67	127	10	1,851	Mh 4,356	Jy 922	1,669	1,668	1			4,766		
15 Flour-mill and gristmill products.....	10	44	9	8	3	1	23	Fe 26	Se 21	26	26				406		
16 Foundry and machine-shop products.....	34	477	20	24	12	4	417	Au 441	Je 308	436	425	11			817		
17 Gas, illuminating and heating.....	12	163	1	11	20	4	127	De 143	Au 115	143	143				207		
18 Hosiery and knit goods.....	7	864	3	12	8	2	839	Ja 863	No 807	822	293	376	68	86	597		
19 Ice, manufactured.....	32	287	22	36	8	3	218	Jy 339	Ja 121	250	243		7		2,964		
20 Leather goods.....	3	13	4				9	Ja 3	De 9	9	9				4		
21 Lumber and timber products.....	851	16,330	1,042	397	253	34	14,004	De 15,967	Jy 13,704	18,127	17,847	17	203		49,400		
22 Marble and stone work.....	36	315	41	9	27	2	236	Se 240	Ja 207	250	245		5		142		
23 Mattresses and spring beds.....	4	56	1	5	2	2	46	Se 52	Ja 39	49	43	6			77		
24 Oil, cottonseed, and cake.....	103	2,190	16	249	150	10	1,765	De 2,888	Au 521	2,855	2,851	3	1		17,730		
25 Patent medicines and compounds and druggists' preparations.....	7	51	11	5	18	7	10	De 12	Je 8	13	13						
26 Printing and publishing.....	161	1,294	171	80	167	42	834	My 848	Jy 816	851	608	128	52	3	603		
27 Turpentine and rosin.....	56	524	63	15	3		443	Se 544	Ja 232	580	556	20	10		2		
28 Wood distillation, not including turpentine and rosin.....	3	28		5	3	1	19	De 35	Au 10	35	35				675		
29 All other industries <sup>4</sup> .....	170	2,798	145	124	94	28	2,407								5,313		

<sup>1</sup> No figures given for reasons explained in the Introduction, page 2. See also discussion of wage earners on page 6.

<sup>2</sup> Same number reported for one or more other months.

<sup>3</sup> Same number reported for entire year.

<sup>4</sup> All other industries embrace—

Artificial stone.....	2	Electrical machinery, apparatus, and supplies.....	1	Rice, cleaning and polishing.....	3
Awnings, tents, and sails.....	3	Food preparations.....	2	Roofing materials.....	1
Bags, other than paper.....	1	Furniture and refrigerators.....	3	Shipbuilding, including boat building.....	1
Baking powders and yeast.....	1	(Glass.....	1	Slaughtering and meat packing.....	2
Baskets, and rattan and willow ware.....	2	Hand stamps, and stencils and brands.....	1	Soap.....	1
Boxes, cigar.....	1	Lead, bar, pipe, and sheet.....	1	Steam packing.....	1
Boxes, fancy and paper.....	1	Leather, tanned, curried, and finished.....	1	Tobacco manufactures.....	10
Brooms.....	4	Lime.....	1	Umbrellas and canes.....	1
Clothing, women's.....	1	Liquors, malt.....	1	Upholstering materials.....	1
Cooperage and wooden goods, not elsewhere specified.....	1	Mineral and soda waters.....	100	Vinegar and cider.....	1
Cordage and twine and jute and linen goods.....	3	Paint and varnish.....	1	Wirework, including wire rope and cable.....	2
Dairymen's, poulterers', and apiarists' supplies.....	1	Paper and wood pulp.....	1	Wood, turned and carved.....	1
Dyeing and finishing textiles.....	1	Paper goods, not elsewhere specified.....	1	Woolen, worsted, and felt goods, and wool huts... 1	
Dyestuffs and extracts.....	1	Paving materials.....	1		
		Pottery, terra-cotta, and fire-clay products.....	4		

STATISTICS OF MANUFACTURES—SOUTH CAROLINA.

THE STATE, BY INDUSTRIES: 1909.

	Capital.	EXPENSES.									Value of products.	Value added by manufacture.	
		Total.	Services.			Materials.		Miscellaneous.					
			Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.			Other.
1	\$178,220,870	\$97,370,829	\$2,568,601	\$1,192,087	\$20,360,750	\$3,106,324	\$63,244,550	\$117,547	\$990,309	\$420,768	\$5,374,293	\$113,235,945	\$46,885,071
2	34,500	23,411	450	535	6,050	290	12,100	178	2,500	798	36,300	36,300	23,910
3	394,086	919,936	21,008	18,339	118,601	15,057	708,257	12,936	5,887	19,251	1,000,920	1,000,920	376,006
4	935,372	585,825	31,453	5,528	232,701	188,011	70,902	3,240	44,900	730,543	402,540	730,543	402,540
5	286,426	258,967	12,400	6,605	63,949	4,572	153,979	1,283	2,161	9,018	318,081	318,081	150,530
6	453,150	412,481	12,595	12,428	104,925	4,026	240,354	3,076	3,112	32,865	463,506	463,506	219,186
7	518,430	1,499,226	12,075	49,483	687,196	16,380	729,504	4,080	4,080	409	1,499,226	1,499,226	753,333
8	71,475	59,657	4,372	1,956	18,807	1,156	23,306	1,000	1,000	1,880	52,657	52,657	28,105
9	113,469	131,804	6,775	4,270	20,196	1,048	93,205	372	919	300	4,710	138,607	44,354
10	129,908	108,737	2,400	6,440	27,016	4,273	57,655	526	526	10,427	129,908	129,908	64,880
11	10,856	54,669	1,000	7,983	1,144	35,875	6,548	361	1,758	71,028	34,009	34,009	
12	99,807	148,276	1,248	2,216	34,900	795	105,155	1,474	1,154	1,334	200,050	200,050	94,100
13	125,549,218	57,614,650	1,124,211	335,851	11,660,658	1,077,500	39,325,839	500,693	148,186	2,442,613	65,029,585	24,626,147	
14	11,857,225	7,571,240	181,057	166,445	671,261	161,717	5,467,741	13,444	83,006	830,509	9,024,900	3,395,442	
15	110,091	327,463	5,000	1,070	7,000	6,185	301,966	763	763	4,879	350,506	350,506	42,355
16	703,431	444,558	33,520	11,492	194,158	17,465	160,753	3,915	4,021	100	19,134	547,218	309,000
17	1,431,202	250,050	23,959	9,920	51,638	94,005	29,044	12	11,379	39,093	333,877	210,828	
18	755,398	576,254	19,787	6,010	151,629	13,321	329,549	406	7,510	49,043	7,969	655,340	321,470
19	1,040,746	307,834	38,565	5,747	84,882	80,520	39,043	212	8,330	2,051	39,484	432,666	304,103
20	23,733	27,956	5,324	46	21,800	600	600	60	60	57	38,659	10,813	
21	15,000,640	10,214,597	512,804	199,927	4,377,760	35,320	3,046,148	14,651	68,921	178,983	880,083	13,140,886	0,150,418
22	218,378	314,904	8,956	20,570	120,072	3,556	140,405	2,326	1,728	4,654	12,537	425,071	281,520
23	75,536	96,171	5,600	2,950	12,093	1,360	62,704	60	429	97	10,968	107,300	43,236
24	6,880,240	10,007,508	232,252	109,449	466,837	316,344	8,403,191	6,338	49,168	6,636	425,383	10,902,035	2,183,400
25	46,153	69,074	7,180	9,447	4,308	48	29,613	1,400	1,138	15,940	90,943	61,282	
26	1,664,485	1,207,074	100,829	128,914	411,586	22,014	317,905	24,855	11,984	26,926	162,051	1,600,501	1,200,672
27	128,727	303,087	7,750	1,165	100,791	1,000	162,777	2,202	2,202	27,483	406,286	242,500	
28	70,436	41,246	4,700	2,700	8,692	4,325	13,650	140	1,000	6,030	51,878	33,903	
29	4,599,733	3,805,994	151,655	91,630	710,217	125,020	2,270,860	23,579	117,120	292	315,612	4,459,909	2,064,020

## MANUFACTURES : SOUTH DAKOTA

## STATISTICS OF MANUFACTURES FOR THE STATE, CITIES, AND INDUSTRIES

Prepared under the supervision of W. M. STEUART, Chief Statistician for Manufactures

## INTRODUCTION.

This bulletin gives the statistics of manufactures for the state of South Dakota for the calendar year 1909 as shown by the Thirteenth Census. It will be reprinted without change as a part of the state Compendium of the Census for South Dakota, and in the final reports of the Thirteenth Census.

The text summarizes the general results of the census inquiry, presenting a series of special tables in which the main facts printed in the general tables are given in convenient form for the state as a whole and for important industries. It also presents tables in which the statistics for the industries of the state as a whole and for a few important industries are classified by character of ownership, size of establishments, number of wage earners, and prevailing hours of labor, information which could not be presented in general tables for each industry without disclosing the facts for individual establishments.

At the end of the bulletin are two general tables.

Table I gives for 1909, 1904, and 1899 the number of establishments and of persons engaged in the industries, primary power, capital, salaries and wages, cost of materials, value of products, and value added by manufacture reported for all industries combined and for certain important industries for the state as a whole. It also gives the same items for all industries combined for Sioux Falls and Aberdeen, cities which had in 1910 a population of over 10,000 but less than 50,000.

Table II gives statistics in greater detail for 1909 for the state and for a larger number of industries.

**Scope of census: Factory industries.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of organization, location of establishments, size of establishments, labor force, and similar subjects. When use is made of the data for these purposes it is imperative that due attention should be given to the limitations of the figures. Particularly is this true when the attempt is made to derive from them figures purporting to show average wages, cost of production, or profits. These limitations will be fully discussed in the general report on manufactures for the United States as a whole. It is impossible to reproduce such discussion in the bulletins relative to the individual states.

The census of 1909, like that of 1904, was confined to manufacturing establishments conducted under the factory system, as distinguished from the neighborhood, hand, and building industries. Where statistics for 1899 are given they have been reduced to a comparable basis by eliminating the latter classes of industries.

The census does not include establishments which were idle during the entire year, or had a value of products of less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions, or in governmental establishments, except those of the Federal Government.

**Period covered.**—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—The term "establishment" comprises the factories, mills, or plants which are under a common ownership or control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment as thus defined were not all located within the same city or state, separate reports were secured in order that the separate totals might be included in the statistics for each city or state. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products very different from those covered by the class designation, and, on the other hand, may not include the total product covered by this designation, because some part of this product may be made in establishments in which it is not the product of chief value.

**Selected industries.**—The general tables at the end of this bulletin give the principal facts separately for the industries of the state. A selection has been made of the leading industries of the state for more detailed consideration. Sometimes an industry of greater importance than some of those selected is omitted because it comprises so few establishments that these detailed presentations would reveal the operations of individual concerns.

**Comparisons with previous censuses.**—Owing to the changes in industrial conditions it is not always possible to classify establishments by industries in such a way as to permit accurate comparison with preceding censuses. Table I, giving comparable figures for 1909, 1904, and 1899, therefore, does not embrace all the industries shown for 1909 in Table II.

**Influence of increased prices.**—In considering changes in cost of materials, value of products, and value added by manufacture, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures can not be taken as an exact measure of increase in the volume of business.

**Persons engaged in industry.**—At the censuses of 1909, 1904, and 1899, the following general classes of persons engaged in manufacturing industries have been distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks, and (5) wage earners. In the censuses of 1904 and 1899 these five classes were shown according to the three main groups: (1) Proprietors and firm members, (2) salaried officials, clerks, etc., and (3) wage earners. The second group included the three classes of salaried officers of corporations, superintendents and managers, and clerks. In the present census an entirely different

grouping is employed: That into (1) proprietors and officials, (2) clerks, and (3) wage earners. The first group includes proprietors and firm members, salaried officers of corporations, and superintendents and managers.

At this census the number of persons engaged in the industries, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for December 15, or the nearest representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where conditions were exceptional, and particularly in the case of certain seasonal industries, the December date could not be accepted as typical and an earlier date had to be chosen.

In the case of employees other than wage earners the number thus reported on December 15 or other representative day has been treated as equivalent to the average for the year, since the number of employees of this class does not vary much from month to month in a given industry. In the case of wage earners the average is obtained in the manner explained in the next paragraph.

**Wage earners.**—In addition to the report by sex and age of the number of wage earners on December 15 or other representative day, a report was obtained of the number employed on the 15th of each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because in view of the variations of date such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In particular, totals by sex and age for the wage earners reported for the representative day would be misleading because of the undue weight given to seasonal industries, in some of which, such as canning and preserving, the distribution of the wage earners by sex and age is materially different from that in most industries of more regular operation. In order to determine as nearly as possible the sex and age distribution of the average number of wage earners in the state as a whole, the following procedure has been adopted:

The percentage distribution by sex and age of the wage earners in each industry, for December 15 or the nearest representative day, has been calculated from the actual numbers reported for that date. This percentage has been applied to the average number of wage earners for the year in that industry, to determine the average number of men, women, and children employed. These calculated averages for the several industries have been added up to give the average distribution for the state as a whole.

In 1899 and 1904 the schedule called for the average number of wage earners of each sex 16 years and over, and the total number under 16 years of age, for each month, and these monthly statements were combined in an annual average. Comparatively few manufacturing concerns, however, keep their books in such way as to show readily the number of men, women, and children (under 16) employed each month. These monthly returns by sex and age were, in fact, largely estimates. It was believed that a more accurate and reliable sex and age distribution could be secured by taking as a basis of estimate the actual numbers employed on a single day.

**Prevailing hours of labor.**—The census made no attempt to ascertain the number of employees working a given number of hours per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and no

attention is given to the fact that a limited number of employees may have hours differing from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

**Capital.**—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

**Materials.**—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term materials includes fuel, rent of power and heat, mill supplies, and containers, as well as materials forming a constituent part of the product. Fuel includes all fuel used, whether for heat, light, or power, or for the process of manufacture.

**Expenses.**—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness, dividends on stock, and allowances for depreciation.

**Value of products.**—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

**Value added by manufacture.**—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishments. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "value added by manufacture."

**Cost of manufacture and profits.**—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products the rate of profit on the investment could not properly be calculated, because of the very defective character of the returns regarding capital.

**Primary power.**—The figures given for this item show the total of the primary power used by the establishments. They do not cover the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

**Location of establishments.**—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the fact that often establishments are located just outside the boundaries

of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

**Laundries.**—The census of 1909 was the first to include statistics of laundries. The reports are confined to establishments using mechanical power. The data are presented separately and are not

included in the general total for manufacturing industries, in order to avoid interference with comparisons with prior censuses.

**Custom grist and saw mills.**—In order to make the statistics for 1909 comparable with those for 1904 the data for these mills have been excluded from all the tables presenting general statistics, and are given in a separate table at the end of this report.

**INDUSTRIES IN GENERAL.**

**General character of the state.**—South Dakota ranks fourteenth in size among the states and territories of continental United States, having an area of 77,650 square miles, of which 76,850 square miles represent land surface. Its population in 1910 was 583,888, as compared with 401,570 in 1900 and 348,600 in 1890. It ranked thirty-sixth among the 49 states and territories as regards population in 1910 and thirty-eighth in 1900.

Lying in the Great Plains region and, with the exception of the Black Hills district, consisting of rolling upland, South Dakota is essentially an agricultural state. In 1910 only 13.1 per cent of the entire population of the state resided in incorporated cities and towns having a population of 2,500 or over, as against 10.2 per cent in 1900. The density of population in 1910 was 7.6 persons per square mile, as compared with 5.2 in 1900. Sioux Falls and Aberdeen were the

only cities with a population of more than 10,000 in 1910. The eastern part of the state and the mining region of the southwest corner are well provided with transportation facilities. Nearly every county east of the Missouri River has one or more railroads.

**Importance and growth of manufactures.**—The agricultural and mining industries of South Dakota are of much more importance than its manufactures. The increase, however, in the number of manufacturing establishments from 1899 to 1909, and that in the average number of wage earners engaged in manufactures, has kept pace with the general increase in population.

The following table gives the more important figures relative to all classes of manufactures combined for the state as returned at the censuses of 1909, 1904, and 1899, together with percentages of increase from census to census:

	NUMBER OR AMOUNT.			PER CENT OF INCREASE.	
	1909	1904	1899	1904-1909	1899-1904
Number of establishments.....	1,020	686	624	48.7	9.9
Persons engaged in manufactures.....	5,226	3,582	( <sup>1</sup> )	45.9	( <sup>1</sup> )
Proprietors and firm members.....	942	649	( <sup>1</sup> )	45.1	( <sup>1</sup> )
Salaried employees.....	682	441	288	54.6	53.1
Wage earners (average number).....	3,602	2,492	2,224	44.5	12.0
Primary horsepower.....	17,666	11,154	11,775	58.4	<sup>2</sup> 5.3
Capital.....	\$13,018,000	\$7,585,000	\$6,051,000	71.6	25.4
Expenses.....	15,787,000	11,246,000	8,155,000	40.4	37.9
Services.....	2,914,000	1,716,000	1,305,000	69.8	31.5
Salaries.....	616,000	294,000	175,000	109.5	68.0
Wages.....	2,298,000	1,422,000	1,130,000	61.6	25.8
Materials.....	11,476,000	8,697,000	6,484,000	32.0	34.1
Miscellaneous.....	1,397,000	833,000	366,000	67.7	127.6
Value of products.....	17,870,000	13,085,000	9,530,000	36.6	37.3
Value added by manufacture (value of products less cost of materials).....	6,394,000	4,388,000	3,046,000	45.7	44.1

<sup>1</sup> Figures not available.

<sup>2</sup> Decense.

In 1909 the state of South Dakota had 1,020 manufacturing establishments operating under the factory system, which gave employment to an average of 5,226 persons during the year and paid out \$2,914,000 in salaries and wages. Of the persons employed, 3,602 were wage earners. These establishments turned out products to the value of \$17,870,000, to produce which materials costing \$11,476,000 were consumed. The value added by manufacture was thus \$6,394,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year:

During the last five years the percentages of increase in value of products, value added by manufacture,

total expenses, and cost of materials were about the same as in the preceding five years (1899 to 1904), but the percentages of increase in the number of wage earners and the amount paid in wages were considerably greater.

As pointed out in the Introduction, it would be improper to infer that manufactures increased in volume during the period 1904-1909 to the extent indicated by these figures regarding values, since the increase shown is certainly due, in part, to the increase that has taken place in the price of commodities.

The relative importance and growth of the leading manufacturing industries of the state are shown in the table following.

## STATISTICS OF MANUFACTURES—SOUTH DAKOTA.

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.		PER CENT OF INCREASE. <sup>1</sup>			
		Average number.	Percent distribution.	Amount.	Percent distribution.	Amount.	Percent distribution.	Value of products.		Value added by manufacture.	
								1901-1909	1899-1904	1901-1909	1899-1904
<b>All industries</b> .....	<b>1,020</b>	<b>3,602</b>	<b>100.0</b>	<b>\$17,870,000</b>	<b>100.0</b>	<b>\$6,394,000</b>	<b>100.0</b>	<b>36.6</b>	<b>37.3</b>	<b>45.7</b>	<b>44.1</b>
Flour-mill and gristmill products.....	95	285	7.9	6,208,000	34.7	872,000	13.6	<sup>2</sup> 4.8	103.1	<sup>2</sup> 24.0	121.6
Butter, cheese, and condensed milk.....	95	130	3.0	2,686,000	15.0	378,000	5.9	23.0	82.1	8.0	84.4
Printing and publishing.....	392	825	22.9	1,976,000	11.1	1,520,000	23.8	61.7	63.8	55.1	67.5
Bread and other bakery products.....	92	286	7.9	1,191,000	6.5	440,000	6.9	199.2	391.1	158.8	240.0
Lumber and timber products.....	58	451	12.5	945,000	5.3	599,000	9.3	150.7	<sup>2</sup> 23.8	112.9	<sup>2</sup> 7.6
Liquors, malt.....	4	70	2.1	606,000	3.4	375,000	5.9	56.2	38.6	56.9	<sup>2</sup> 1.2
Tobacco manufactures.....	59	203	5.6	454,000	2.5	290,000	4.5	38.4	66.5	44.3	57.0
Cars and general shop construction and repairs by steam-railroad companies.....	5	327	9.1	439,000	2.5	274,000	4.3	74.9	41.0	128.3	31.9
Confectionery.....	3	166	3.0	400,000	2.2	129,000	2.0	20.5	.....	.....	.....
Gas, illuminating and heating.....	17	108	3.0	278,000	1.6	158,000	2.5	87.8	.....	58.0	.....
Artificial stone.....	38	104	2.9	253,000	1.4	133,000	2.1	301.6	.....	209.4	.....
Foundry and machine-shop products.....	37	78	2.2	225,000	1.3	152,000	2.4	1.8	.....	29.0	.....
Carriages and wagons and materials.....	10	48	1.3	131,000	0.7	71,000	1.1	322.6	<sup>2</sup> 36.7	238.1	<sup>2</sup> 27.6
Brick and tile.....	12	54	1.5	103,000	0.6	72,000	1.1	22.6	82.6	12.5	93.9
All other industries.....	103	512	14.2	2,005,000	11.2	934,000	14.6	264.5	<sup>2</sup> 81.7	160.9	<sup>2</sup> 57.5

<sup>1</sup> Per cent of increase is based on figures in Table I.<sup>2</sup> Decrease.

It should be borne in mind, in considering this table, that the value of products in some of the industries involves a certain amount of duplication, due to the use of the products of one establishment in the industry as material for another establishment.

The most important industries listed in this table, in which they are arranged in the order of the value of products, call for brief consideration.

*Flour-mill and gristmill products.*—The statistics show that this industry continues to lead in value of products, reporting in 1909 more than one-third of the total value of products for the state. Compared with the returns, however, for 1904, there has been a decrease of 4.8 per cent in the value of products and of 24.9 per cent in value added by manufacture.

*Butter, cheese, and condensed milk.*—The establishments reported for this industry are engaged primarily in the manufacture of butter, no cheese nor condensed milk being produced in 1909. This industry increased much more rapidly during the period from 1899 to 1904 than during the latter half of the decade.

*Printing and publishing.*—Over one-third of the total number of manufacturing establishments and nearly one-fourth of the total number of wage earners of the state are engaged in this industry. The 392 establishments embraced 378 publishers of newspapers and periodicals, 13 job printing offices, and one bookbinding establishment.

*Bread and other bakery products.*—An increase of nearly 200 per cent was shown in the value of the bakery products reported for 1909, as compared with 1904.

*Lumber and timber products.*—The development of this industry in South Dakota during the last five years is shown in the increase in value of products and in value added by manufacture. The former item decreased 23.8 per cent from 1899 to 1904, but increased 150.7 per cent from 1904 to 1909, and the latter item decreased 7.6 per cent during the earlier

period and increased 112.9 per cent during the later. The increase in the later five-year period is due partly to the large increase in the cut of western yellow pine during this period as well as to an advance in the price of this timber, which constitutes almost the entire lumber cut of South Dakota.

The above table shows that when these five leading industries are ranked according to value added by manufacture the order differs considerably from that when the ranking is by value of products. In value added by manufacture the leading industry is printing and publishing, which ranked third in value of products. It leads also in the number of wage earners employed.

This table shows also the percentages of increase for these leading industries in respect to value of products and value added by manufacture.

In some of the less important industries the percentage of increase in value of products from 1904 to 1909 was very large, amounting to over 300 per cent in two industries—artificial stone and carriages and wagons.

In addition to the 14 industries presented separately, there are 7 other industries each of which had a value of product in 1909 in excess of \$100,000. They are included under the head of "All other industries" because, if they were shown separately, the operations of individual establishments would be disclosed, or because the data for prior censuses are not available or comparable, or because the returns do not properly present the true condition of the industry, for the reason that it is more or less interwoven with one or more industries of similar character. These 7 industries are: Automobiles, including bodies and parts; cement; men's clothing, including shirts; copper, tin, and sheet-iron products; marble and stone work; mineral and soda water; and slaughtering and meat packing. The 1909 statistics, however, for the manufacture of copper, tin, and sheet-iron products and marble and stone work will be found in Table II.

**Persons engaged in manufacturing industries.**—The following table shows the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables, is an estimate obtained by the method described in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
<b>All classes</b> .....	<b>5,226</b>	<b>4,588</b>	<b>638</b>
Proprietors and officials.....	1,227	1,188	39
Proprietors and firm members.....	942	900	30
Salaried officers of corporations.....	96	95	1
Superintendents and managers.....	189	187	2
Clerks.....	307	255	142
Wage earners (average number).....	3,602	3,145	457
16 years of age and over.....	3,556	3,009	457
Under 16 years of age.....	46	46	

The average number of persons engaged in manufactures during 1909 was 5,226. Of these, 3,602 were wage earners. Of the remainder, about three-fourths were proprietors and officials and about one-fourth were clerks. Corresponding figures for individual industries will be found in Table II.

The following table shows the percentage of proprietors and officials, clerks, and wage earners, respectively, and the total number of persons employed in manufactures. It covers all industries combined and five important industries individually.

INDUSTRY.	Total number.	PERSONS ENGAGED IN MANUFACTURES.		
		Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
<b>All industries</b> .....	<b>5,226</b>	<b>23.5</b>	<b>7.6</b>	<b>68.9</b>
Bread and other bakery products.....	431	27.4	6.3	66.4
Butter, cheese, and condensed milk.....	252	32.1	12.7	55.2
Flour-mill and gristmill products.....	454	30.2	7.0	62.8
Lumber and timber products.....	634	13.1	2.4	84.5
Printing and publishing.....	1,387	30.1	10.5	59.5
All other industries.....	2,168	18.6	6.8	74.5

Of the total number of persons engaged in all manufacturing industries, 23.5 per cent were proprietors and officials, 7.6 per cent clerks, and 68.9 per cent wage earners. The proportion of proprietors and officials is much greater than in states where the manufacturing industries are highly developed, for the reason that in South Dakota a very large proportion of the establishments are small and the work done largely by the proprietors or by their immediate representatives.

The following table shows in percentages, for all industries combined, the distribution of the average number of wage earners by age periods and sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries

separately, the percentage distribution, by age periods and sex, of the wage earners as reported for December 15 or the nearest representative day. As a means of judging the importance of the several industries the average total number employed for the year is also given in each case.

INDUSTRY.	WAGE EARNERS.			
	Average number. <sup>1</sup>	Per cent of total.		
		16 years of age and over.		Under 16 years of age.
Male.	Female.			
<b>All industries</b> .....	<b>3,602</b>	<b>86.0</b>	<b>12.7</b>	<b>1.3</b>
Bread and other bakery products.....	280	65.7	32.9	1.4
Butter, cheese, and condensed milk.....	139	95.7	4.3	
Flour-mill and gristmill products.....	285	90.6		0.4
Lumber and timber products.....	451	99.8		0.2
Printing and publishing.....	825	69.5	28.0	2.5
All other industries.....	1,616	91.0	7.8	1.2

<sup>1</sup> For method of estimating the distribution by sex and age periods, of the average number in all industries combined, see Introduction.

For all industries combined, 86 per cent of the average number of wage earners were males over 16 years of age; 12.7 per cent females over that age; and 1.3 per cent all persons under the age of 16. The largest part of the total number of female wage earners over 16 years of age and of children under that age were confined to the bakery and printing industries combined. In the bakery industry about one-third of the total wage earners employed were females, and in the printing industry about three-tenths of the total employees were of that class.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904, it is necessary to use the classification employed at the earlier census. (See Introduction.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				
	1909		1904		Per cent of increase, 1904-1909.
	Number.	Per cent distribution.	Number.	Per cent distribution.	
<b>Total</b> .....	<b>5,226</b>	<b>100.0</b>	<b>3,582</b>	<b>100.0</b>	<b>45.9</b>
Proprietors and firm members.....	942	18.0	649	18.1	45.1
Salaried employees.....	682	13.0	441	12.3	54.6
Wage earners (average number).....	3,602	68.9	2,492	69.6	44.5

Comparable figures are not obtainable for 1899. The table shows a somewhat greater percentage of increase in the salaried employees than in the other two classes.

The table following shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over, according to sex, for 1909, 1904, and 1899. The averages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

STATISTICS OF MANUFACTURES—SOUTH DAKOTA.

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Percent distribution.	Number.	Percent distribution.	Number.	Percent distribution.
Total.....	3,602	100.0	2,492	100.0	2,224	100.0
16 years of age and over..	3,556	98.7	2,459	98.7	2,114	95.1
Male.....	3,099	86.0	2,179	87.4	2,033	91.4
Female.....	457	12.7	280	11.2	81	3.6
Under 16 years of age....	46	1.3	33	1.3	110	4.9

This table indicates that very few children are employed in the manufacturing industries of the state, and that the present proportion of children is less than it was 10 years ago, although there was a slight increase in the number from 1904 to 1909.

From 1904 to 1909, as well as from 1899 to 1904, there was a proportional and actual increase in the employment of female wage earners.

Wage earners employed by months.—The following table gives the number of wage earners employed on the 15th of each month during the year 1909, for all industries combined, for the lumber industry, and for all other industries combined; it gives also the percentage which the number reported for each month is of the greatest number reported for any month. In Table II, page 14, is shown, for each industry in the state, the largest number and also the smallest number of employees reported for any month. The number for each month relates to the 15th day or the nearest representative day of that month.

MONTH.	NUMBER OF WAGE EARNERS.									
	All Industries.		Lumber and timber products.						All other industries.	
	Number.	Per cent of maximum.	Total.		In mills.		In logging operations.		Number.	Per cent of maximum.
			Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.		
January.....	3,108	79.2	331	58.0	188	50.1	143	75.3	2,777	81.1
February.....	3,235	82.4	405	82.7	275	73.3	190	100.0	2,770	80.9
March.....	3,374	86.0	490	80.5	298	78.9	100	100.0	2,888	81.3
April.....	3,373	85.9	360	65.7	240	64.0	120	67.0	3,004	87.7
May.....	3,543	90.3	380	68.7	284	75.7	102	53.7	3,157	82.2
June.....	3,703	95.0	470	84.7	343	91.5	133	70.0	3,287	86.0
July.....	3,824	97.4	515	91.0	363	96.8	152	80.0	3,309	86.6
August.....	3,779	96.3	304	70.1	201	77.6	103	54.3	3,385	88.8
September.....	3,925	100.0	500	80.0	351	93.6	149	78.4	3,425	100.0
October.....	3,860	98.3	497	88.4	335	80.3	162	85.3	3,363	98.2
November.....	3,869	98.6	562	100.0	375	100.0	187	98.4	3,307	98.6
December.....	3,572	91.0	434	77.2	291	77.0	143	75.3	3,138	91.6

The lumber industry shows more fluctuations in the number of wage earners employed than any other important industry. The greatest activity in logging operations is shown for February and March. In the mills the minimum number of wage earners was employed in January, the number fluctuating until November, when the maximum number was employed. For all industries combined the number of wage earners employed was lowest in January, and increased gradually until reaching the maximum in September.

Prevailing hours of labor.—In the following table wage earners have been classified according to hours of labor prevailing in the establishments in which they are employed. In making this classification the average number of wage earners employed during the year is used, and the number employed in each establishment is classified as a total, according to the hours prevailing in that establishment, even though some few employees work a greater or less number of hours.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All Industries.....	3,602	516	82	746	40	1,932	131	39	116
Artificial stone.....	104	.....	3	3	.....	98	.....	.....	.....
Bread and other bakery products.....	286	10	3	20	.....	219	1	14	4
Brick and tile.....	54	.....	.....	10	.....	44	.....	.....	.....
Butter, cheese, and condensed milk.....	139	7	.....	18	.....	86	20	.....	.....
Carriages and wagons and materials.....	48	.....	.....	.....	.....	48	.....	.....	.....
Cars and general shop construction and repairs by steam-railroad companies.....	327	.....	.....	.....	.....	313	14	.....	.....
Confectionery.....	106	.....	.....	33	.....	73	.....	.....	.....
Flour-mill and gristmill products.....	285	28	.....	9	.....	175	48	25	.....
Foundry and machine-shop products.....	78	2	.....	4	.....	72	.....	.....	12
Gas, illuminating and heating.....	108	6	.....	1	10	36	37	.....	.....
Liquors, malt.....	70	15	.....	43	.....	18	.....	.....	.....
Lumber and timber products.....	451	8	3	13	.....	425	2	.....	.....
Marble and stone work.....	116	8	.....	83	4	21	.....	.....	.....
Printing and publishing.....	826	207	73	447	7	91	.....	.....	.....
Tobacco manufactures.....	203	198	.....	3	.....	2	.....	.....	.....
All other industries.....	306	18	.....	53	13	212	.....	.....	13

It appears from these figures that a majority of the wage earners employed in the manufacturing industries of South Dakota are employed 60 hours or over per week, the proportion being 61.6 per cent of all wage earners. The artificial stone industry, the bakeries, the railroad repair shops, the flour mills, and the lumber mills and logging camps were mainly on a 10-hour-per-day basis (60 hours per week). Shorter hours prevail in printing and publishing, 88.1 per cent of the total number of wage earners in that industry being employed in establishments running 54 hours or less per week. Eight hours per day were the prevailing hours in the tobacco industry.

Location of establishments.<sup>1</sup>—The next table shows the distribution of manufacturing between cities having a population of 10,000 or over and the remainder of the state.

ITEM.	Year.	Total.	LOCATION OF ESTABLISHMENTS.		PER CENT OF TOTAL.	
			In cities with population of 10,000 and over.	Outside districts.	In cities with population of 10,000 and over.	Outside districts.
Population.....	1910	583,888	24,847	550,041	4.3	95.7
	1900	401,570	10,266	391,304	2.6	97.4
Number of establishments.	1909	1,020	120	900	11.8	88.2
	1904	886	61	825	8.0	91.1
	1899	624	48	576	7.7	92.3
Average number of wage earners.	1909	3,602	972	2,630	27.0	73.0
	1904	2,492	465	2,027	18.7	81.3
	1899	2,224	311	1,913	14.0	86.0
Value of products.	1909	\$17,870,135	\$4,404,069	\$13,466,066	25.0	75.0
	1904	13,085,333	1,897,790	11,187,543	14.5	85.5
	1899	9,529,946	883,624	8,646,322	9.3	90.7
Value added by manufacture.	1909	6,393,785	1,823,764	4,570,021	28.5	71.5
	1904	4,388,502	832,097	3,556,405	19.0	81.0
	1899	3,046,269	592,096	2,454,173	18.5	81.5

At the census of 1900 Sioux Falls was the only city having over 10,000 inhabitants, but in 1910 Aberdeen became a city of that class. The population for the census of 1900 was used in grouping data for 1904 as well as for 1899. The addition, therefore, of Aberdeen in 1909 accounts in part for the relatively large increase in urban manufactures during the period 1904-1909.

Character of ownership.—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available. Figures for 1909 only are presented for five important industries.

<sup>1</sup> See Introduction.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>				
1909.....	1,020	3,602	\$17,870,135	\$6,393,785
1904.....	886	2,492	13,085,333	4,388,502
Individual:				
1909.....	583	1,045	4,047,905	1,876,363
1904.....	370	810	3,222,105	1,373,597
Firm:				
1909.....	100	425	2,027,528	908,217
1904.....	125	452	2,842,052	902,559
Corporation:				
1909.....	210	2,070	9,870,131	3,479,291
1904.....	112	1,145	6,003,547	1,943,511
Other:				
1909.....	61	50	1,024,571	129,914
1904.....	73	79	1,017,020	168,835
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
Individual:				
1909.....	57.2	29.0	22.7	29.3
1904.....	54.8	32.7	24.6	31.3
Firm:				
1909.....	15.7	11.8	16.4	14.2
1904.....	18.2	18.1	21.7	20.6
Corporation:				
1909.....	21.2	57.6	55.2	54.4
1904.....	16.3	45.0	45.9	44.3
Other:				
1909.....	6.0	1.0	5.7	2.0
1904.....	10.6	3.2	7.8	3.8
<b>Bread and other bakery products, 1909</b>				
Individual.....	92	286	\$1,160,536	\$480,170
Firm.....	60	111	470,994	160,409
Corporation.....	20	35	177,890	79,697
Other.....	3	140	511,682	168,974
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	75.0	38.8	40.6	43.4
Firm.....	21.7	12.2	15.3	18.1
Corporation.....	3.3	40.0	44.1	38.5
<b>Butter, cheese, and condensed milk, 1909</b>				
Individual.....	95	139	\$2,665,511	\$877,478
Firm.....	30	20	548,852	88,705
Corporation.....	8	17	218,840	34,402
Other.....	12	47	1,080,131	165,113
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	31.6	18.7	20.4	23.5
Firm.....	8.4	12.2	8.1	9.1
Corporation.....	12.6	33.8	38.0	43.7
Other.....	47.4	35.3	32.8	23.6
<b>Flour-mill and gristmill products, 1909</b>				
Individual.....	95	285	\$6,208,216	\$872,461
Firm.....	31	47	892,441	170,557
Corporation.....	23	64	1,250,308	200,177
Other.....	35	174	3,022,605	472,706
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	32.6	16.5	14.4	19.5
Firm.....	24.2	22.5	20.1	22.0
Corporation.....	36.8	61.1	63.5	54.2
Other.....	6.3	...	2.0	3.3
<b>Lumber and timber products, 1909</b>				
Individual.....	58	451	\$944,777	\$595,866
Firm.....	34	83	202,084	114,431
Corporation.....	9	31	110,570	82,741
Other.....	15	337	631,523	308,864
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	58.0	18.4	21.5	19.2
Firm.....	15.5	6.9	11.7	13.9
Corporation.....	25.0	74.7	66.8	66.0
<b>Printing and publishing, 1909</b>				
Individual.....	392	825	\$1,975,976	\$1,519,482
Firm.....	272	402	851,070	678,653
Corporation.....	40	71	170,221	135,884
Other.....	74	350	941,037	698,703
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	69.4	48.7	43.1	44.7
Firm.....	10.2	8.6	8.9	8.9
Corporation.....	18.9	42.4	47.0	46.0
Other.....	1.5	0.2	0.4	0.4

## STATISTICS OF MANUFACTURES—SOUTH DAKOTA.

The proportion of establishments operated by firms was smaller in 1909 than in 1904 and the proportion under corporate ownership considerably larger. In addition the establishments operated by individuals and by firms reported smaller proportions of the total average number of wage earners, the total value of products, and the total value added by manufacture in 1909 than in 1904. In 1909 corporations reported more than half the totals for each of these items, a much larger proportion than they reported at the preceding census. Of the value of products reported by the flour-mill and gristmill industry and by the lumber industry, 63.5 per cent and 66.8 per cent, respectively, are returned by establishments under this form of ownership. Of the 61 establishments classified as under "other" forms of ownership, 45 were engaged in making butter and were operated under the cooperative form of ownership.

**Size of establishment.**—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it, the following table groups the establishments according to the value of their products. The table also shows the average size of establishments for all industries combined and for important industries separately, as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the last two censuses, while for certain important industries figures are given for 1909 only.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>				
1909.....	1,020	3,602	\$17,870,135	\$6,898,785
1904.....	686	2,492	13,085,833	4,388,502
Less than \$5,000:				
1909.....	533	558	1,264,308	876,341
1904.....	319	384	751,832	553,810
\$5,000 and less than \$20,000:				
1909.....	309	878	3,144,801	1,541,435
1904.....	216	687	2,202,435	1,076,446
\$20,000 and less than \$100,000:				
1909.....	142	1,056	5,652,440	1,923,529
1904.....	130	895	5,885,287	1,890,200
\$100,000 and less than \$1,000,000:				
1909.....	36	1,110	7,808,496	2,062,489
1904.....	21	526	4,245,779	888,956
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
Less than \$5,000:				
1909.....	52.3	15.5	7.1	13.7
1904.....	46.5	15.4	5.7	12.6
\$5,000 and less than \$20,000:				
1909.....	30.3	24.4	17.6	24.1
1904.....	31.5	27.6	16.8	24.5
\$20,000 and less than \$100,000:				
1909.....	13.9	29.3	31.6	30.1
1904.....	19.0	35.9	45.0	42.6
\$100,000 and less than \$1,000,000:				
1909.....	3.5	30.8	43.7	32.1
1904.....	3.1	21.1	32.4	20.3
Average per establishment:				
1909.....		4	\$17,520	\$6,268
1904.....		4	19,075	6,397

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>Bread and other bakery products, 1909.....</b>	<b>92</b>	<b>286</b>	<b>\$1,160,536</b>	<b>\$439,170</b>
Less than \$5,000.....	41	29	119,905	55,706
\$5,000 and less than \$20,000.....	44	94	408,128	171,558
\$20,000 and less than \$100,000.....	7	163	632,503	211,816
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	44.6	10.1	10.3	12.7
\$5,000 and less than \$20,000.....	47.8	32.9	35.2	39.1
\$20,000 and less than \$100,000.....	7.6	57.0	54.5	48.2
Average per establishment.....		3	\$12,615	\$4,774
<b>Butter, cheese, and condensed milk, 1909.....</b>	<b>95</b>	<b>139</b>	<b>\$2,685,611</b>	<b>\$377,478</b>
Less than \$5,000.....	6	4	16,959	3,347
\$5,000 and less than \$20,000.....	49	41	614,556	99,335
\$20,000 and less than \$100,000.....	30	63	1,215,578	151,083
\$100,000 and less than \$1,000,000.....	4	31	838,418	132,113
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	6.3	2.9	0.6	0.9
\$5,000 and less than \$20,000.....	51.6	29.5	22.9	24.1
\$20,000 and less than \$100,000.....	37.9	45.3	45.3	40.0
\$100,000 and less than \$1,000,000.....	4.2	22.3	31.2	35.0
Average per establishment.....		1	\$28,269	\$3,973
<b>Flour-mill and gristmill products, 1909.....</b>	<b>95</b>	<b>285</b>	<b>\$6,208,216</b>	<b>\$872,451</b>
Less than \$5,000.....	11	6	33,899	6,340
\$5,000 and less than \$20,000.....	22	21	285,406	58,526
\$20,000 and less than \$100,000.....	45	120	2,139,453	301,756
\$100,000 and less than \$1,000,000.....	17	138	3,749,548	415,829
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	11.6	2.1	0.5	0.7
\$5,000 and less than \$20,000.....	23.2	7.4	4.6	6.7
\$20,000 and less than \$100,000.....	47.4	42.1	34.5	44.0
\$100,000 and less than \$1,000,000.....	17.9	48.4	60.4	47.7
Average per establishment.....		3	\$65,350	\$9,184
<b>Lumber and timber products, 1909.....</b>	<b>58</b>	<b>451</b>	<b>\$944,777</b>	<b>\$595,806</b>
Less than \$5,000.....	22	30	60,845	44,767
\$5,000 and less than \$20,000.....	28	95	258,604	156,284
\$20,000 and less than \$100,000.....	5	46	183,337	91,583
\$100,000 and less than \$1,000,000.....	3	280	441,931	303,231
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	37.0	6.7	6.4	7.5
\$5,000 and less than \$20,000.....	48.3	21.1	27.4	26.2
\$20,000 and less than \$100,000.....	8.6	10.2	19.4	15.4
\$100,000 and less than \$1,000,000.....	5.2	62.1	46.8	50.9
Average per establishment.....		8	\$16,280	\$10,274
<b>Printing and publishing, 1909.....</b>	<b>392</b>	<b>825</b>	<b>\$1,975,978</b>	<b>\$1,519,483</b>
Less than \$5,000.....	316	303	603,406	657,938
\$5,000 and less than \$20,000.....	99	229	622,609	412,152
\$20,000 and less than \$100,000.....	16	233	750,871	649,372
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	80.6	44.0	35.1	36.7
\$5,000 and less than \$20,000.....	15.3	27.8	26.5	27.1
\$20,000 and less than \$100,000.....	4.1	28.2	38.5	36.2
Average per establishment.....		2	\$5,041	\$3,876

<sup>1</sup> Includes the group "\$100,000 and less than \$1,000,000."

This table shows that, in 1909, of the 1,020 establishments, only 36, or 3.5 per cent, had a value of products exceeding \$100,000. These establishments, however, had a total average number of wage earners of 1,110, or 30.8 per cent of the total for the state; 43.7 per cent of the total value of products; and 32.1 per cent of the total value added by manufacture.

On the other hand, the very small establishments—that is, those having a value of products of less than \$5,000—represented more than one-half (52.3 per cent) of the total number of establishments, while the average number of wage earners employed in them formed only 15.5 per cent of the total, and the value of their products only 7.1 per cent.

The fact that the average value of products per establishment decreased from \$19,075 to \$17,520, and the average value added by manufacture from \$6,397 to \$6,268, is due chiefly to the disproportionate increase in the number of very small establishments. Out of a total increase of 334 establishments, there were 214 each of which had a product valued at less than \$5,000. There was no change in the average number of wage earners per establishment. Considering only the five leading industries which are included in the table, the average value of products per establishment varies from \$5,041 for the printing

and publishing industry to \$65,350 for flour and grist mills.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The next table shows such a classification for all industries combined and for five important industries, and gives not only the number of establishments falling in each group but also the average number of wage earners employed.

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All Industries	1,020	146	787	83	17	4	3			
Bread and other bakery products	92	17	71	3			1			
Butter, cheese, and condensed milk	95	0	84	2						
Flour-mill and gristmill products	95	12	70	12	1					
Lumber and timber products	58	2	46	0	1	2	1			
Printing and publishing	392	72	300	16	4					
All other industries	288	34	196	44	11	2	1			
AVERAGE NUMBER OF WAGE EARNERS.										
All Industries	3,602		1,456	835	517	310	484			
Bread and other bakery products	280		134	19			133			
Butter, cheese, and condensed milk	139		114	25						
Flour-mill and gristmill products	285		162	96	27					
Lumber and timber products	451		106	43	22	149	131			
Printing and publishing	825		538	178	109					
All other industries	1,610		402	474	350	161	220			
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All Industries	100.0		40.4	23.2	14.4	8.6	13.4			
Bread and other bakery products	100.0		46.9	6.0			46.5			
Butter, cheese, and condensed milk	100.0		82.0	18.0						
Flour-mill and gristmill products	100.0		56.8	33.7	9.5					
Lumber and timber products	100.0		23.5	9.5	4.9	33.0	29.0			
Printing and publishing	100.0		65.2	21.6	13.2					
All other industries	100.0		24.0	20.3	22.2	10.0	13.6			

The per cent distribution of the number of establishments is not shown in this table; of the 1,020 establishments reported for all industries, 89.5 per cent employed no wage earners or from 1 to 5 wage earners each, while only 3 establishments employed over 100 wage earners each.

Of the total number of wage earners, 40.4 per cent were in establishments employing from 1 to 5 wage earners each. The creamery and the printing and publishing industries are the leading industries in this group. The group of establishments employing from 6 to 20 wage earners reported 23.2 per cent of the total number of wage earners, and the 3 establishments which employed over 100 wage earners each reported 13.4 per cent of the total.

**Expenses.**—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of

the different classes of expenses going to make up the total.

The following table shows in percentages the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All Industries	3.9	14.6	72.7	8.9
Bread and other bakery products	3.0	15.3	73.1	8.6
Butter, cheese, and condensed milk	1.7	4.4	90.7	3.2
Flour-mill and gristmill products	1.4	3.2	91.1	4.3
Lumber and timber products	3.6	33.6	39.0	23.7
Printing and publishing	12.2	35.6	32.9	19.2
All other industries	6.3	25.6	56.0	12.2

This table shows that, for all industries combined, 72.7 per cent of the total expenses was incurred for

materials, 18.5 per cent for services—that is, salaries and wages—and but 8.9 per cent for other purposes. As would be expected, these proportions vary greatly in the different industries.

**Engines and power.**—The following table shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 <sup>1</sup>	1909	1904	1899 <sup>1</sup>	1909	1904	1899
Primary power, total.....	972	436	507	17,666	11,154	11,775	100.0	100.0	100.0
Owued.....	648	436	507	15,980	10,063	11,603	90.5	98.3	90.0
Steam.....	253	214	308	12,257	8,483	9,256	69.4	76.1	78.6
Gas and oil.....	366	180	158	2,784	1,397	1,270	15.8	12.5	10.8
Water wheels.....	24	31	41	927	1,060	1,000	5.2	9.5	9.3
Water motors.....	5	5	( <sup>2</sup> )	12	9	( <sup>2</sup> )	0.1	0.1	( <sup>2</sup> )
Other.....				14		38		0.1	0.3
Rented.....	324	( <sup>2</sup> )	( <sup>2</sup> )	1,686	191	112	9.5	1.7	1.0
Electric.....	324	( <sup>2</sup> )	( <sup>2</sup> )	1,683	181	100	9.5	1.6	0.8
Other.....				3	10	12	( <sup>2</sup> )	0.1	0.1
Electric motors.....	340	23	7	2,084	330	234	100.0	100.0	100.0
Run by current generated by establishments.....	22	23	7	401	158	134	10.2	46.6	57.3
Run by rented power.....	324	( <sup>2</sup> )	( <sup>2</sup> )	1,683	181	100	80.8	53.4	42.7

<sup>1</sup> Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.

<sup>2</sup> Not reported.

<sup>3</sup> Less than one-tenth of 1 per cent.

The table indicates that the increase in primary power was principally in power generated by steam. Electric power also shows a large increase, while water power shows a decrease. The more general

use of gas engines is shown, the number of such engines being 366 in 1909, as compared with 186 in 1904 and 158 in 1899. The number of motors run by rented power was not reported in 1904 and 1899, hence comparative figures are not available for the two earlier censuses. The horsepower furnished by electric motors run by rented power increased from 181 in 1904 to 1,683 in 1909. In 1904, 98.3 per cent of the total horsepower was owned by the establishments reporting, while in 1909 only 90.5 per cent was so reported. During the same period the proportion of rented electric horsepower increased from 1.6 per cent to 9.5 per cent. The horsepower developed by electric motors run by current generated in the manufacturing establishments reporting increased from 134 in 1899 to 158 in 1904 and 401 in 1909.

**Fuel.**—Closely related to the question of kind of power employed is that of the fuel used in generating this power, or otherwise as material in the manufacturing processes. Because a large amount of fuel is consumed in the manufacture of gas, it is included in addition to the five important industries in the following table, which shows the quantity of each kind of fuel used in 1909:

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gasoline (barrels).	Gas (1,000 feet).	Other (tons).
All industries.....	2,744	102,547	3,960	4,030	15,315	106,436	1
Bread and other bakery products.....	808	881	374	1,172	121	1,477	
Butter, cheese, and condensed milk.....	27	5,230			111	32	
Flour-mill and grist-mill products.....	522	26,702		9	1,681	100,000	
Gas, illuminating and heating.....	22	4,720	3,120		11,314		
Lumber and timber products.....		2,755			171	4	
Printing and publishing.....	632	1,400	23	318	960	2,241	
All other industries.....	733	69,700	434	2,531	957	2,682	

SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

(With statistics for laundries and custom saw and grist mills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and value of materials and products which do not appear on the general schedule. Certain data as to the products for three important industries of South Dakota are here presented.

Flour-mill and gristmill products.—Wheat is the principal agricultural crop of South Dakota, and naturally flour-mill and gristmill products ranked first among its manufactures. The following tabular statement gives the quantity and value of products for the last three census years:

PRODUCTS.	1909	1904	1899
<b>Products, total value.....</b>	<b>\$6,208,216</b>	<b>\$6,519,364</b>	<b>\$3,208,532</b>
Wheat flour:			
White—			
Barrels.....	962,840	1,142,805	897,026
Value.....	\$5,041,149	\$5,360,128	\$2,643,678
Graham—			
Barrels.....	5,446	5,219	(1)
Value.....	\$23,648	\$23,242	(1)
Corn meal and corn flour:			
Barrels.....	6,845	23,303	14,652
Value.....	\$23,413	\$49,571	\$23,480
Rye flour:			
Barrels.....	2,570	2,835	2,744
Value.....	\$12,022	\$11,414	\$6,651
Buckwheat flour:			
Pounds.....	219,675	26,000	(2)
Value.....	\$7,199	\$1,010	(2)
Barley meal:			
Pounds.....	361,000	40,000	347,000
Value.....	\$7,500	\$700	\$4,080
Feed:			
Tons.....	9,840	16,713	14,001
Value.....	\$245,786	\$286,438	\$185,130
Offal:			
Tons.....	44,272	55,845	33,868
Value.....	\$830,022	\$780,371	\$341,573
All other products, value.....	\$5,477	\$400	\$3,040

<sup>1</sup> Included in figures for white wheat flour. <sup>2</sup> Figures not available.

There was a decrease in the value of products between 1904 and 1909, due to a falling off of 6 per cent in the value and of 15.7 per cent in the quantity of white flour manufactured. The figures for buckwheat flour and barley meal show notable increases for the same five-year period, the quantity of the former product increasing more than eightfold and of the latter product ninefold.

Butter.—The quantity and value of products for 1909, 1904, and 1899 are given in the table following.

The value of solid packed butter represented 90.3 per cent in 1909, 97 per cent in 1904, and 94.6 per cent in 1899 of the total value of products. From 1899 to 1904 this class of product decidedly increased both in quantity and in value, while from 1904 to 1909, notwithstanding a marked decrease in quantity, there was an increase in the value.

The quantity and value of skimmed milk sold shows

a very large decrease from census to census. This is due to the radical change which has taken place in the creamery industry. Formerly whole milk was brought to the creamery while at present the cream is largely separated on the farm and sold as such.

PRODUCTS.	1909	1904	1899
<b>Products, total value.....</b>	<b>\$2,085,511</b>	<b>\$2,182,053</b>	<b>\$1,199,493</b>
Butter:			
Packed solid—			
Pounds.....	8,880,010	10,835,596	6,110,726
Value.....	\$2,424,897	\$2,116,900	\$1,134,228
Prints and rolls—			
Pounds.....	615,598	222,864	61,881
Value.....	\$173,510	\$54,423	\$14,739
Cream sold:			
Pounds.....	390,108	2,140	1,596
Value.....	\$43,147	\$215	\$1,070
Skimmed milk:			
Pounds.....	1,116,882	4,491,814	9,690,340
Value.....	\$1,583	\$7,903	\$8,670
All other products, value.....	\$42,368	\$13,212	\$40,786

Does not include 1 cheese establishment.

Printing and publishing.—The progress of the newspaper and periodical branch of the industry is indicated in the following statement, which shows the number and aggregate circulation per issue for the different classes of publications for the years 1909, 1904, and 1899:

PERIOD OF ISSUE.	NUMBER OF PUBLICATIONS.			AGGREGATE CIRCULATION PER ISSUE.		
	1909	1904	1899	1909	1904	1899
<b>Total.....</b>	<b>402</b>	<b>302</b>	<b>221</b>	<b>485,101</b>	<b>380,705</b>	<b>232,166</b>
Daily.....	19	16	16	40,153	21,910	16,463
Sunday.....	4	5	3	23,526	11,350	(1)
Semiweekly.....	3	5	1	4,400	6,850	1,600
Weekly.....	360	263	189	277,127	198,604	151,488
Monthly.....	11	11	9	23,750	58,600	34,400
All other classes.....	5	2	3	110,145	33,391	25,265

<sup>1</sup> Included in circulation for dailies.

In 1909 the aggregate circulation per issue of the newspapers and periodicals of the state was 485,101, which represents an increase of 46.7 per cent over the corresponding figure for 1904. Weekly publications have a greater circulation than all other periodicals combined; out of a total of 402 newspapers and periodicals published in 1909, 360, or 89.6 per cent, were published weekly. The proportion which the weeklies formed of the total number in 1904 was 87.1 per cent, while in 1899 it was 85.5 per cent. There was an increase of three in the number of dailies from 1904 to 1909, but during the same period the combined average circulation of all dailies increased over 100 per cent.

Laundries.—Statistics for steam laundries are not included in the general tables. In 1909 there were 28 such establishments in the state of South Dakota, 4 of which were located in Aberdeen and 3 in Sioux Falls. The following statement summarizes the statistics:

Number of establishments.....	28
Persons engaged in the industry.....	447
Proprietors and firm members.....	33
Salaried employees.....	28
Wage earners (average number).....	386
Primary horsepower.....	519
Capital.....	\$336,276
Expenses.....	313,492
Services.....	190,830
Materials.....	81,770
Miscellaneous.....	40,892
Amount received for work done.....	423,092

Sixteen establishments were operated by individuals, 4 by corporations, and 8 by general partnerships. Nine establishments had receipts for the year's business of less than \$5,000; 9, receipts of \$5,000 but less than \$20,000; and 10, receipts of \$20,000 but less than \$100,000.

The number of wage earners employed each month and the per cent which this number represented of the greatest number employed in any month were as follows:

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	352	85.0	July.....	410	99.0
February.....	352	85.0	August.....	414	100.0
March.....	356	86.0	September.....	406	98.1
April.....	369	89.1	October.....	393	96.1
May.....	384	92.8	November.....	395	95.4
June.....	394	95.2	December.....	397	95.9

The different kinds of primary power, the number of engines, and the amount of horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines.	Horsepower.
<b>Primary power, total.....</b>		<b>519</b>
Owned.....	26	396
Steam engines.....	19	360
Gas engines.....	7	36
Rented—Electric.....	23	123

The kind and amount of fuel used are shown in the following tabular statement:

KIND.	Unit.	Quantity.
Anthracite coal.....	Tons.....	19
Bituminous coal.....	Tons.....	6,265
Wood.....	Cords.....	1
Oil.....	Barrels.....	216
Gas.....	1,000 feet.....	5,236

Custom saw and grist mills.<sup>1</sup>—Statistics for custom saw and grist mills are not included in the general tables, but are presented in the following summary:

Number of establishments.....	4
Persons engaged in the industry.....	4
Proprietors and firm members.....	3
Wage earners (average number).....	1
Primary horsepower.....	82
Capital.....	\$15,500
Expenses.....	29,637
Services.....	400
Materials.....	28,630
Miscellaneous.....	607
Value of products.....	36,102

<sup>1</sup> Includes one custom sawmill.

<sup>2</sup> Includes estimated cost of grain ground.

STATISTICS OF MANUFACTURES—SOUTH DAKOTA.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.

THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employees.	Wage earners (average number).							
<b>STATE—All Industries.....</b>	1909	1,020	5,226	942	682	3,602	17,666	\$13,018	\$616	\$2,298	\$11,476	\$17,870	\$6,394
	1904	686	3,532	649	441	2,492	11,154	7,585	284	1,422	8,697	13,085	4,888
	1899	624	( <sup>1</sup> )	( <sup>1</sup> )	288	2,224	11,775	6,051	175	1,130	6,484	9,530	3,046
Artificial stone.....	1909	38	168	40	15	104	130	190	10	02	120	253	133
	1904	4	40	2	0	35	20	37	4	18	27	63	30
	1899												
Bread and other bakery products.....	1909	92	431	114	31	283	120	500	30	151	721	1,101	440
	1904	32	109	41	12	118	81	170	7	49	218	388	170
	1899	13	51	17	8	26	( <sup>1</sup> )	23	2	14	20	79	50
Brick and tile.....	1909	12	72	5	13	54	700	227	10	28	31	103	72
	1904	10	64	9	6	49	355	175	3	27	20	84	64
	1899	11	67	19		48	192	64		20	13	49	33
Butter, cheese, and condensed milk.....	1909	95	252	50	63	130	1,450	633	44	112	2,308	2,086	378
	1904	97	350	32	126	192	1,410	484	26	125	1,833	2,133	350
	1899	138	287	44	95	148	1,570	461	12	77	1,005	1,100	194
Carriages and wagons and materials.....	1909	10	64	10	0	48	04	133	4	38	60	131	71
	1904	3	23	2	2	19	10	54	2	13	10	31	21
	1899	9	( <sup>1</sup> )	( <sup>1</sup> )		25	41	44		14	20	49	20
Cars and general shop construction and repairs by steam-railroad companies.....	1909	5	346		10	327	557	250	23	243	165	439	274
	1904	0	197		13	184	270	107	15	106	131	251	120
	1899	7	126		9	117	70	68	8	80	87	173	91
Confectionery.....	1909	3	136		30	106	60	203	38	36	271	400	129
	1904	5	121	3	21	97	15	182	20	35	101	332	141
	1899	( <sup>2</sup> )											
Flour-mill and gristmill products.....	1909	95	454	83	80	285	7,364	2,873	70	187	5,330	6,208	872
	1904	96	521	110	64	347	6,777	2,428	57	203	5,358	6,519	1,161
	1899	86	( <sup>1</sup> )	( <sup>1</sup> )	52	275	( <sup>1</sup> )	1,047	47	148	2,685	3,209	524
Foundry and machine-shop products.....	1909	37	137	45	14	78	307	352	8	62	73	225	152
	1904	11	138	12	3	123	269	188	6	124	54	221	107
	1899	13	38	18	1	19	( <sup>1</sup> )	42	( <sup>2</sup> )	8	14	39	25
Gas, illuminating and heating.....	1909	17	144		36	108	318	1,317	26	64	120	278	168
	1904	7	61		14	47	115	654	9	20	48	143	100
	1899	( <sup>3</sup> )											
Liquors, malt.....	1909	4	103		27	76	796	1,330	42	59	231	606	375
	1904	4	87		17	70	267	930	24	44	149	388	230
	1899	4	74	3	10	61	218	561	12	24	38	280	242
Lumber and timber products.....	1909	58	534	52	31	451	2,260	941	33	301	349	945	596
	1904	26	227	23	13	191	833	244	13	114	97	377	280
	1899	30	418	( <sup>1</sup> )	17	371	( <sup>1</sup> )	233	15	170	192	495	303
Marble and stone work.....	1909	15	148	18	14	116	213	132	13	76	73	220	147
	1904	5	33	6	3	24	41	69	2	20	46	97	51
	1899	7	( <sup>1</sup> )	( <sup>1</sup> )	2	125	( <sup>1</sup> )	58	2	45	10	114	104
Printing and publishing.....	1909	302	1,387	350	203	825	931	2,159	170	493	456	1,076	1,520
	1904	270	1,001	301	108	692	428	1,344	35	312	242	1,222	980
	1899	209	770	224	62	494	( <sup>1</sup> )	737	37	204	161	746	585
Tobacco manufactures.....	1909	59	287	72	12	203		216	12	122	104	454	230
	1904	47	227	55	5	167		125	5	87	127	323	201
	1899	27	168	30	0	120		84	5	60	60	197	128
All other industries.....	1909	88	563	85	82	396	2,246	1,553	74	264	998	1,785	787
	1904	54	317	53	25	239	259	304	17	119	140	453	307
	1899	64	( <sup>1</sup> )	( <sup>1</sup> )	33	380	( <sup>1</sup> )	2,029	35	266	2,161	2,899	738

CITIES OF ABERDEEN AND SIOUX FALLS—ALL INDUSTRIES COMBINED.

<b>ABERDEEN.....</b>	1909	37	430	36	99	295	540	\$1,132	\$94	\$178	\$1,011	\$1,575	\$564
<b>SIOUX FALLS.....</b>	1909	83	937	86	174	677	1,402	2,805	161	385	1,629	2,889	1,260
	1904	61	633	67	101	465	( <sup>1</sup> )	1,748	98	248	1,066	1,898	832
	1899	48	( <sup>1</sup> )	( <sup>1</sup> )	67	311	( <sup>1</sup> )	927	42	162	322	884	562

<sup>1</sup> Figures not available.

<sup>2</sup> Does not include statistics for one establishment, to avoid disclosure of individual operations.

<sup>3</sup> Figures can not be shown without disclosing individual operations.

<sup>4</sup> Does not include statistics for two establishments, to avoid disclosure of individual operations.

<sup>5</sup> Less than \$500.

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.				Primary horsepower.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners.			Total.	16 and over.		Under 16.			
					Male.	Female.	Average number.	Number.			Male.	Female.	Male.	Female.		
								Maximum month.	Minimum month.							
1 All industries .....	1,020	5,226	942	285	255	142	3,602	Se 3,925	Ja 3,108	170	170			17,668		
2 Artificial stone .....	38	168	49	11	3	1	104	Je <sup>1</sup> 106	Ja 24	170	170			120		
3 Bread and other bakery products .....	92	431	114	4	13	14	286	Au 325	Mh 259	278	183	91	4	120		
4 Brick and tile .....	12	72	5	1	2		64	Je 106	Ja <sup>1</sup> 8	103	103			700		
5 Brooms .....	5	23	5		1	1	18	Ja <sup>2</sup> 16	Au <sup>2</sup> 10	16	10			2		
6 Butter, cheese, and condensed milk .....	95	252	50	31	18	14	139	Jy 170	Fe <sup>1</sup> 110	131	125	6		1,450		
7 Carriages and wagons and materials .....	10	54	10	3	2	1	48	De 60	Fe <sup>1</sup> 42	69	60			94		
8 Cars and general shop construction and repairs by steam-railroad companies .....	5	346		12	7		327	De 398	My 209	398	398			57		
9 Confectionery .....	3	136		7	18	5	106	No 130	Jy 89	121	46	75		60		
10 Copper, tin, and sheet-iron products .....	8	33	7	2	3	1	20	Jy <sup>1</sup> 25	Ja 15	19	17			8		
11 Flour-mill and gristmill products .....	95	454	83	54	22	10	285	No 320	My 253	323	322		2	7,364		
12 Foundry and machine-shop products .....	37	137	45	7	6	1	78	Jy 89	Ja 65	91	91			307		
13 Fur goods .....	3	15	3			2	10	No <sup>1</sup> 17	My <sup>1</sup> 5	17	3	14		1		
14 Gas, illuminating and heating .....	17	144		17	9	10	108	Jy 160	Fe <sup>1</sup> 78	102	102			308		
15 Jewelry .....	3	11	4	1			6	De <sup>1</sup> 7	My 5	6	5	1		5		
16 Leather goods .....	3	9	3	2			4	Fe <sup>1</sup> 0	Ja <sup>1</sup> 4	4	4					
17 Lime .....	6	29	3	1	1		24	No 42	Fe <sup>1</sup> 18	38	38					
18 Liquors, malt .....	4	103		16	10	1	76	Au 88	No 69	72	69		3	700		
19 Lumber and timber products .....	58	534	52	18	10	3	451	No 562	Ja 331	608	606		2	2,200		
20 Marble and stone work .....	15	148	18	4	9	1	116	Je 145	Fe 60	133	132		1	210		
21 Patent medicines and compounds and druggists' preparations .....	3	4		2			2	Ja <sup>2</sup> 2	Au <sup>2</sup> 2	2	1	1				
22 Printing and publishing .....	392	1,387	359	58	84	61	825	De 858	Ja 704	878	609	246	23	931		
23 Tobacco manufactures .....	59	287	72	3	9		203	De 227	Ap 185	232	187	35	10			
24 All other industries .....	57	439	60	21	28	16	314							2,231		

<sup>1</sup> Same number reported for one or more other months.

<sup>2</sup> Same number reported throughout the year.

<sup>3</sup> All other industries embrace—

Agricultural implements .....	3	Flavoring extracts .....	1	Photo-engraving .....	1
Automobiles, including bodies and parts .....	3	Furnishing goods, men's .....	1	Shipbuilding, including boat building .....	1
Awnings, tents, and sails .....	2	Furniture and refrigerators .....	2	Slaughtering and meat packing .....	1
Carpets, rag .....	2	Grease and tallow .....	1	Stoves and furnaces, including gas and oil stoves .....	1
Cars and general shop construction and repairs by street-railroad companies .....	1	Leather, tanned, curried, and finished .....	1	Type foundry and printing materials .....	1
Cement .....	1	Mattresses and spring beds .....	2	Typewriters and supplies .....	1
Clothing, men's, including shirts .....	2	Mineral and soft waters .....	25	Wall plaster .....	1
Coffee and spice, roasting and grinding .....	1	Models and patterns, not including paper patterns .....	1		
		Paint and varnish .....	1		

STATISTICS OF MANUFACTURES—SOUTH DAKOTA.

THE STATE, BY INDUSTRIES: 1909.

	Capital.	EXPENSES.										Value of products.	Value added by manufacture.
		Total.	Services.			Materials.		Miscellaneous.					
			Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.		
1	\$13,017,932	\$16,787,191	\$324,561	\$291,060	\$2,297,512	\$507,855	\$10,968,495	\$93,868	\$145,837	\$196,243	\$961,760	\$17,870,135	\$6,393,785
2	190,472	199,327	7,690	2,060	61,644	2,715	117,354	330	1,111	963	5,460	253,407	133,335
3	500,429	986,951	7,200	22,576	151,404	28,204	693,162	19,639	4,180	-----	60,586	1,160,536	430,170
4	226,870	79,632	8,855	720	27,504	19,838	10,736	5	1,126	-----	10,842	102,660	72,086
5	21,445	25,622	-----	1,420	8,340	306	12,003	-----	82	-----	3,462	33,404	21,065
6	633,230	2,545,073	22,154	21,760	111,770	33,097	2,274,036	5,339	3,033	-----	72,984	2,085,511	377,478
7	133,121	108,348	2,900	1,380	37,952	3,824	56,499	70	1,215	13	4,495	131,384	71,061
8	258,972	438,921	18,070	5,210	243,499	20,030	145,018	-----	1,075	-----	6,019	438,919	273,871
9	203,204	375,659	14,560	23,671	35,714	4,790	266,497	1,804	765	-----	27,808	400,240	128,962
10	40,543	88,130	3,600	2,979	13,899	560	48,406	1,688	179	-----	16,813	107,048	58,676
11	2,872,621	5,854,359	58,147	21,044	187,206	110,320	5,219,445	979	17,451	6,054	227,653	6,208,216	872,451
12	352,214	156,233	5,434	2,270	62,386	8,724	64,277	604	2,120	285	10,043	225,471	162,470
13	42,900	30,206	-----	936	4,966	175	19,610	1,200	133	-----	3,186	42,737	22,952
14	1,317,421	230,914	15,418	10,106	63,716	78,357	41,166	-----	5,776	-----	25,345	277,669	158,016
15	13,231	14,305	200	-----	6,279	92	6,986	-----	504	-----	144	17,001	10,523
16	12,400	12,700	600	-----	3,483	42	7,650	620	100	-----	205	17,780	10,097
17	34,900	36,234	300	90	14,742	8,367	12,558	-----	57	-----	130	38,510	17,595
18	1,330,410	461,208	28,300	13,791	58,798	25,003	205,358	-----	61,108	-----	78,070	605,999	374,948
19	940,540	894,682	22,240	10,395	300,940	13,406	335,445	1,021	7,049	152,168	52,009	944,777	595,860
20	132,045	178,907	4,488	8,985	75,942	3,413	69,257	3,624	774	600	11,884	219,865	147,108
21	5,250	8,803	1,500	-----	1,500	-----	3,980	740	100	357	626	12,033	8,053
22	2,159,079	1,385,567	69,451	100,074	493,317	41,755	414,739	38,799	12,137	21,070	193,625	1,975,976	1,519,482
23	216,861	359,682	3,540	8,340	121,858	1,901	101,869	7,871	31,716	-----	22,597	454,281	290,521
24	1,371,756	1,306,548	29,965	33,247	210,584	96,180	781,524	8,941	4,310	14,163	127,654	1,515,590	637,876

## MANUFACTURES : TENNESSEE

## STATISTICS OF MANUFACTURES FOR THE STATE, CITIES, AND INDUSTRIES

Prepared under the supervision of W. M. STEUART, Chief Statistician for Manufactures

## INTRODUCTION.

This advance bulletin gives the statistics of manufactures for the state of Tennessee for the calendar year 1909 as shown by the Thirteenth Census. It will be reprinted without change as a part of the Compendium of the Census for Tennessee and in the final reports of the Thirteenth Census.

The text summarizes the general results of the census inquiry, presenting a series of special tables in which the main facts printed in the general tables are given in convenient form for the state as a whole and for important industries. It also presents tables in which the statistics for the industries of the state as a whole and for a few important industries are classified by character of ownership, size of establishments, number of wage earners, and prevailing hours of labor, information which could not be presented in general tables for each industry without disclosing the facts for individual establishments.

At the end of the bulletin are two general tables.

Table I gives for 1909, 1904, and 1899 the number of establishments and of persons engaged in the industries, primary power, capital, salaries and wages, cost of materials, value of products, and value added by manufacture reported for all industries combined and for certain important industries (1) for the state as a whole and (2) for the cities of Memphis and Nashville. It also gives the same items for all industries combined for every city and town having in 1910 a population of over 10,000 but less than 50,000.

Table II gives statistics in detail for 1909 for the state and for a larger number of industries.

**Scope of census: Factory industries.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of organization, location of establishments, size of establishments, labor force, and similar subjects. When use is made of the data for these purposes, it is imperative that due attention should be given to the limitations of the figures. Particularly is this true when the attempt is made to derive from them figures purporting to show average wages, cost of production, or profits. These limitations will be fully discussed in the general report on manufactures for the United States as a whole. It is impossible to reproduce such discussion in the bulletins relative to the individual states.

The census of 1909, like that of 1904, was confined to manufacturing establishments conducted under the factory system, as distinguished from the neighborhood, hand, and building industries. Where statistics for 1899 are given they have been reduced to a

comparable basis by eliminating the latter classes of industries. The census does not include establishments which were idle during the entire year, or had a value of products of less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions, or in governmental establishments, except those of the Federal Government.

**Period covered.**—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—The term "establishment" comprises the factories, mills, or plants which are under a common ownership or control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment as thus defined were not all located within the same city or state, separate reports were secured in order that the separate totals might be included in the statistics for each city or state. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products very different from those covered by the class designation, and, on the other hand, may not include the total product covered by this designation, because some part of this product may be made in establishments in which it is not the product of chief value.

**Selected industries.**—The general tables at the end of this bulletin give the principal facts separately for the industries of the state. A selection has been made of the leading industries of the state for more detailed consideration. Sometimes an industry of greater importance than some of those selected is omitted because it comprises so few establishments that these detailed presentations would reveal the operations of individual concerns.

**Comparisons with previous censuses.**—Owing to the changes in industrial conditions it is not always possible to classify establishments by industries in such a way as to permit accurate comparison with preceding censuses. Table I, giving comparable figures for 1909, 1904, and 1899, therefore, does not embrace all the industries shown for 1909 in Table II.

**Influence of increased prices.**—In considering changes in cost of materials, value of products, and value added by manufacture, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures can not be taken as an exact measure of increase in the volume of business.

**Persons engaged in industry.**—At the censuses of 1909, 1904, and 1899 the following general classes of persons engaged in manufacturing industries have been distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks, and (5) wage earners. In the censuses of 1904 and 1899 these five classes were shown according to the three main groups: (1) Proprietors and firm members, (2) salaried officials, clerks, etc., and (3) wage earners. The second group included the three classes of salaried officers of corporations, superintendents and

managers, and clerks. In the present census an entirely different grouping is employed: That in to (1) proprietors and officials, (2) clerks, and (3) wage earners. The first group includes proprietors and firm members, salaried officers of corporations, and superintendents and managers.

At this census the number of persons engaged in the industries, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for December 15, or the nearest representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where conditions were exceptional, and particularly in the case of certain seasonal industries, such as canning, the December date could not be accepted as typical, and an earlier date had to be chosen.

In the case of employees other than wage earners the number thus reported on December 15, or other representative day, has been treated as equivalent to the average for the year, since the number of employees of this class does not vary much from month to month in a given industry. In the case of wage earners the average is obtained in the manner explained in the next paragraph.

**Wage earners.**—In addition to the report by sex and age of the number of wage earners on December 15, or other representative day, a report was obtained of the number employed on the 15th of each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because in view of the variations of date such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In particular, totals by sex and age for the wage earners reported for the representative day would be misleading because of the undue weight given to seasonal industries, in some of which, such as canning and preserving, the distribution of the wage earners by sex and age is materially different from that in most industries of more regular operation. In order to determine as nearly as possible the sex and age distribution of the average number of wage earners in the state as a whole, the following procedure has been adopted:

The percentage distribution by sex and age of the wage earners in each industry, for December 15, or the nearest representative day, has been calculated from the actual numbers reported for that date. This percentage has been applied to the average number of wage earners for the year in that industry, to determine the average number of men, women, and children employed. These calculated averages for the several industries have been added up to give the average distribution for the state as a whole.

In 1899 and 1904 the schedule called for the average number of wage earners of each sex 16 years and over, and the total number under 16 years of age, for each month, and these monthly statements were combined in an annual average. Comparatively few manufacturing concerns, however, keep their books in such way as to show readily the number of men, women, and children (under 16) employed each month. These monthly returns by sex and age were, in fact, largely estimates. It was believed that a more accurate and reliable sex and age distribution could be secured by taking as a basis of estimate the actual numbers employed on a single day.

**Prevailing hours of labor.**—The census made no attempt to ascertain the number of employees working a given number of hours

per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and no attention is given to the fact that a limited number of employees may have hours differing from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

**Capital.**—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

**Materials.**—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term materials includes fuel, rent of power and heat, mill supplies, and containers, as well as materials forming a constituent part of the product. Fuel includes all fuel used, whether for heat, light, or power, or for the process of manufacture.

**Expenses.**—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness, and allowances for depreciation.

**Value of products.**—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

**Value added by manufacture.**—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishments. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "value added by manufacture."

**Cost of manufacture and profits.**—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products, the rate of profit on the investment could not properly be calculated, because of the very defective character of the returns regarding capital.

**Primary power.**—The figures given for this item show the total of the primary power used by the establishments. They do not cover the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

**Location of establishments.**—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the fact that often establishments are located just outside the boundaries of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

**Laundries.**—The census of 1909 was the first to include statistics

of laundries. The reports are confined to establishments using mechanical power. The data are presented separately and are not included in the general total for manufacturing industries, in order to avoid interference with comparisons with prior censuses.

**Custom sawmills and gristmills.**—In order to make the statistics for 1909 comparable with those for 1904 the data for these mills have been excluded from all the tables presenting general statistics, and are given in a separate table at the end of this report.

**INDUSTRIES IN GENERAL.**

**General character of the state.**—Tennessee has a gross area of 42,022 square miles, of which 335 represent water surface. Its population in 1910 was 2,184,789, as compared with 2,020,616 in 1900 and 1,767,518 in 1890. It ranked seventeenth among the 49 states and territories of continental United States as regards population in 1910 and fourteenth in 1900. The density of population for the entire state is 52.4 per square mile, the corresponding figure for 1900 being 48.5. Of the entire population of the state, 20.2 per cent resided in cities and incorporated towns having a population of 2,500 inhabitants or over, as against 16.2 per cent in 1900.

Memphis, with a population of 131,105, and Nashville with 110,364, are the only cities in the state having over 50,000 inhabitants in 1910. Three other cities have a population of over 10,000 but less than 50,000, namely, Chattanooga, Knoxville, and Jackson. Apart from these five cities, only 4.7 per cent of the population resided in cities and incorporated towns of 2,500 inhabitants or over.

The transportation facilities of the state are good, as the Mississippi, Tennessee, and Cumberland Rivers afford advantages for communication by water, while the trunk lines of a number of large railway systems, several of which center at Memphis, cross the state

and afford direct connection with all parts of the country.

**Importance and growth of manufactures.**—Tennessee is preeminently an agricultural and mining state, and its manufactures are based largely upon its rich natural resources. The development of manufacturing in the state has about kept pace with that in the United States as a whole, the value of the manufactures of the state representing about the same relative proportion, less than 1 per cent, of the total value of products of the manufacturing industries of the United States in 1849-50 and in 1909.

In 1849 the total value of the manufactures of the state, including the products of the neighborhood and hand industries, amounted to only \$9,725,608, while in 1909, exclusive of the value of products of the neighborhood and hand industries, it reached \$180,216,548, an increase of over seventeen times in 60 years. During the same period the population of the state increased 117.9 per cent. The gross value of products per capita of the total population of the state increased from \$10 in 1849 to \$82 in 1909.

The following table gives the most important figures relative to all classes of manufactures combined for 1909, 1904, and 1899, together with the percentages of increase from census to census:

	NUMBER OR AMOUNT.			PER CENT OF INCREASE.	
	1900	1904	1899	1904-1900	1899-1904
Number of establishments.....	4,609	3,175	3,116	45.2	1.9
Persons engaged in manufactures.....	87,672	69,287	(1)	26.5	(1)
Proprietors and firm members.....	5,415	3,805	(1)	42.3	(1)
Salaried employees.....	8,417	4,910	3,329	71.4	47.5
Wage earners (average number).....	73,840	60,572	45,963	21.9	31.8
Primary horsepower.....	242,277	175,780	130,318	37.8	34.9
Capital.....	\$167,924,000	\$102,439,000	\$63,141,000	63.9	62.2
Expenses.....	158,980,000	119,328,000	78,358,000	33.2	52.3
Services.....	37,438,000	27,886,000	17,776,000	34.3	56.9
Salaries.....	9,136,000	5,080,000	3,048,000	80.8	66.7
Wages.....	28,252,000	22,806,000	14,728,000	23.9	54.8
Materials.....	104,016,000	79,352,000	54,559,000	31.1	45.4
Miscellaneous.....	17,526,000	12,090,000	6,023,000	45.0	100.7
Value of products.....	180,217,000	137,960,000	92,749,000	30.6	48.7
Value added by manufacture (value of products less cost of materials).....	76,201,000	58,608,000	38,190,000	30.0	53.5

<sup>1</sup> Figures not available.

In 1909 the state of Tennessee had 4,609 manufacturing establishments, which gave employment to an average of 87,672 persons during the year and paid out \$37,438,000 in salaries and wages. Of the persons employed, 73,840 were wage earners. These establishments turned out products to the value of

\$180,217,000, to produce which materials costing \$104,016,000 were used. The value added by manufacture was thus \$76,201,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year.

## MANUFACTURES—TENNESSEE.

In general, this table indicates that while there was considerable development in manufactures during the five-year period 1904-1909, the percentage of increase in most items was less than for the preceding five-year period, 1899-1904. The greatest relative increases during the later period were in number of establishments (45.2 per cent), number of salaried employees (71.4 per cent), and salaries (80.8 per cent). The number of wage earners increased 21.9 per cent, the value of products 30.6 per cent, and value added by

manufacture 30 per cent. As pointed out in the Introduction, it would be improper to infer that manufactures increased in volume to the full extent indicated by these figures regarding values, since the increase shown is certainly due in part to the increase that has taken place in the price of commodities.

The relative importance and growth of the leading manufacturing industries of the state are shown in the following table:

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.		PER CENT OF INCREASE. <sup>1</sup>			
		Average number.	Per cent distribution.	Amount.	Per cent distribution.	Amount.	Per cent distribution.	Value of products.		Value added by manufacture.	
								1904-1909	1899-1904	1904-1909	1899-1904
All industries.....	4,609	73,840	100.0	\$180,217,000	100.0	\$76,201,000	100.0	30.6	48.7	30.0	53.5
Lumber and timber products.....	1,977	22,389	30.3	30,457,000	16.9	16,816,000	22.1	13.4	40.2	10.1	55.2
Flour-mill and gristmill products.....	454	1,577	2.1	29,070,000	16.1	3,784,000	5.0	14.7	32.3	10.0	21.2
Foundry and machine-shop products.....	124	4,041	5.5	9,190,000	5.1	4,030,000	5.1	50.1	31.0	41.6	38.6
Printing and publishing.....	413	2,914	3.9	7,173,000	4.0	5,219,000	6.8	40.9	47.4	38.5	46.4
Cars and general shop construction and repairs by steam-railroad companies.....	17	5,500	7.5	6,777,000	3.8	3,601,000	4.8	16.1	87.6	28.0	80.5
Oil, cottonseed, and cake.....	20	806	1.1	6,593,000	3.7	1,392,000	1.8	76.1	25.0	110.9	-6.0
Cotton goods, including cotton small wares.....	17	3,078	4.2	5,201,000	2.9	1,867,000	2.4	46.1	78.5	40.7	54.9
Iron and steel, blast furnaces.....	13	1,143	1.5	4,653,000	2.6	1,272,000	1.7	35.7	-27.0	55.3	-40.3
Hosiery and knit goods.....	22	3,117	4.2	3,595,000	2.0	1,445,000	1.9	119.0	312.2	119.3	351.4
Patent medicines and compounds and druggists' preparations.....	76	433	0.6	3,515,000	2.0	2,174,000	2.9				
Clothing, men's, including shirts.....	34	1,506	2.2	3,361,000	1.9	1,238,000	1.6	9.5	74.4	3.9	60.2
Furniture and refrigerators.....	42	2,419	3.3	3,300,000	1.8	1,801,000	2.4				
Fertilizers.....	12	559	0.8	3,249,000	1.8	1,127,000	1.5	20.3	84.2	14.0	48.3
Carriages and wagons and materials.....	129	1,706	2.3	3,040,000	1.7	1,001,000	2.1	-7.3	93.7	-0.6	76.5
Bread and other bakery products.....	131	855	1.2	2,592,000	1.6	1,102,000	1.4	46.5	70.0	15.6	126.0
Leather, tanned, curried, and finished.....	25	395	0.5	2,530,000	1.4	530,000	0.7	-20.4	27.9	-26.0	18.6
Confectionery.....	31	894	1.2	2,520,000	1.4	893,000	1.1	34.5	130.1	-5.4	133.8
Liquors, distilled.....	30	154	0.2	2,256,000	1.3	1,301,000	2.4	297.2	-30.6	406.5	-67.8
Leather goods.....	47	604	0.8	2,139,000	1.2	826,000	1.1	10.7	59.3	0.0	75.1
Slaughtering and meat packing.....	27	280	0.4	2,057,000	1.1	447,000	0.6				
Liquors, malt.....	5	302	0.5	2,044,000	1.1	1,391,000	1.8	11.0	55.9	-0.3	52.8
Stoves and furnaces, including gas and oil stoves.....	17	1,685	1.5	1,951,000	1.1	1,234,000	1.6	74.8		60.9	
Woolen, worsted, and felt goods, and wool hats.....	21	1,654	2.2	1,802,000	1.0	675,000	0.9	5.0	12.5	-11.3	18.4
Marble and stone work.....	81	1,066	1.4	1,465,000	0.8	985,000	1.3	55.2	11.7	62.8	-4.0
Ice, manufactured.....	57	779	1.1	1,324,000	0.7	1,043,000	1.4	93.6	27.1	85.9	31.1
Brick and tile.....	91	1,281	1.7	1,308,000	0.7	962,000	1.3	18.9	60.0	15.2	60.9
Gas, illuminating and heating.....	11	422	0.6	1,282,000	0.7	925,000	1.2	54.5	45.1	47.8	43.2
Copper, tin, and sheet-iron products.....	57	572	0.8	1,229,000	0.7	636,000	0.8	41.1	147.4	45.0	123.6
Coffins, burial cases, and undertakers' goods.....	8	480	0.6	1,189,000	0.7	667,000	0.9	28.8	47.7	10.2	93.9
Boots and shoes, including cut stock and findings.....	4	374	0.5	1,181,000	0.6	354,000	0.5	41.1		70.7	
Cooperage and wooden goods, not elsewhere specified.....	19	856	1.2	1,148,000	0.6	519,000	0.7				
Agricultural implements.....	16	645	0.9	1,004,000	0.6	591,000	0.8	30.6	60.1	23.9	74.3
Mattresses and spring beds.....	17	272	0.4	666,000	0.4	294,000	0.4	50.5	65.8	33.0	168.3
Coke.....	8	250	0.3	586,000	0.3	108,000	0.1	-27.7	5.9	-45.7	-17.8
Paint and varnish.....	6	71	0.1	397,000	0.2	159,000	0.2	-17.5	218.5	-17.0	211.3
Pottery, terra-cotta, and fire-clay products.....	6	323	0.4	328,000	0.2	218,000	0.3	6.1	18.8	-5.2	23.7
Lime.....	20	415	0.6	323,000	0.2	230,000	0.3	-0.9		12.2	
Boxes, fancy and paper.....	6	202	0.3	258,000	0.1	136,000	0.2	31.6	48.5	47.8	33.3
Canning and preserving.....	37	303	0.4	206,000	0.1	75,000	0.1	-14.9	230.1	-17.0	167.6
Millinery and lace goods.....	6	92	0.1	202,000	0.1	101,000	0.1	11.6		26.2	
All other industries.....	466	7,840	10.6	26,787,000	14.9	11,186,000	14.7				

<sup>1</sup> Per cent of increase is based on figures in Table I, and a minus sign (-) denotes a decrease. Where percentages are omitted, the figures are not comparable.

It should be borne in mind in considering this table that the value of products in some of the industries involves a certain amount of duplication, due to the use of the products of one establishment in the industry as material for another establishment.

In addition to the 40 industries presented separately in the above table, there are 19 other industries, each of which reported products valued at more than \$200,000 in 1909. These are included under the head of "All other industries," because in some in-

stances, if they were shown separately, the operations of individual establishments would be disclosed; in others, because the returns do not properly present the true conditions of the industry, as it is more or less interwoven with one or more other industries; and in others because comparable statistics for the different census years can not be presented on account of changes in classification. These industries are: Bags, other than paper; brooms; cars and general shop construction and repairs by street-railroad com-

panies; cars, steam-railroad, not including the operations of railroad companies; cement; coffee and spice, roasting and grinding; dyestuffs and extracts; explosives; flavoring extracts; food preparations; glass; iron and steel, steel works and rolling mills; mineral and soda waters; smelting and refining, copper; soap; sulphuric, nitric, and mixed acids; tobacco manufactures; vinegar and cider; and wood, turned and carved. Statistics, however, for the manufacture of bags, other than paper, the broom industry, street-railroad repair shops, and the construction of steam-railroad cars are presented in Table II, page 22, for 1909.

The most important industries listed in this table, in which they are arranged in the order of the value of products, call for brief consideration.

*Lumber and timber products.*—This industry embraces logging operations, sawmills, planing mills, and establishments engaged in the manufacture of wooden packing boxes. The statistics of mills engaged exclusively in custom sawing for local consumption are not included in the general tables or in the totals for manufacturing industries. Separate statistics for the custom sawmills are given on page 17. In spite of the fact that the rate of increase in this industry was comparatively small for the period from 1904 to 1909, it still leads all other industries in the state, having in 1909 over two-fifths of the number of establishments and reporting over one-sixth of the total value of products and nearly one-third of the total number of wage earners.

*Flour-mill and gristmill products.*—In value of products this industry stood but little below the lumber and timber products industry in 1909, reporting 16.1 per cent of the total for the state. The rate of growth, however, was less from 1904 to 1909 than from 1899 to 1904. There was a slight decrease during the last five years in the number of wage earners employed, due perhaps to improved methods of manufacturing and of handling grain and the manufactured products. The soil and climatic conditions of the state are well adapted, especially in the eastern and middle sections, to the raising of wheat and corn. Owing to the comparatively simple processes involved in this class of manufacture, as well as the extent to which these processes are carried on by machinery, the value added by manufacture and the number of wage earners employed are small in proportion to the gross value of products.

*Foundry and machine-shop products.*—This classification embraces not only foundries and machine shops but establishments engaged in the manufacture of gas machines, hardware, plumbers' supplies, steam fitting and heating apparatus, iron and steel pipe, cast, and structural ironwork. The industry was really of greater importance in the state than is indicated by the statistics, as some machine shops manufactured a distinctive product and were assigned to other clas-

sifications. The number of establishments engaged in the industry increased from 100 in 1904 to 124 in 1909. During this period the value of products increased 50.1 per cent and the value added by manufacture 41.6 per cent.

*Printing and publishing.*—All establishments engaged in bookbinding and blank-book making, steel engraving and plate printing, job printing, and the printing and publishing of newspapers, periodicals, books, and music are included under this head. This industry has had a substantial growth during each of the two five-year periods.

*Cars and general shop construction and repairs by steam-railroad companies.*—This industry is peculiar among the manufacturing industries of the country. It represents the work done in the car shops of steam-railroad companies and is practically confined to the repairs to the rolling stock and equipment of their own roads, although, to a limited extent, there may be some new construction of rolling stock. The statistics are exclusive of minor repairs in roundhouses.

*Oil, cottonseed, and cake.*—The statistics include those for all establishments engaged primarily in extracting oil from cotton seed or refining crude cottonseed oil. The industry is entirely dependent upon the production of cotton, as it utilizes the seed, of which, prior to 1870, comparatively little use was made. In this industry a very decided increase in value of products is shown from 1904 to 1909, accompanied by an increase of 15 per cent in the number of wage earners. The establishments are located principally in the southern and western, or cotton-growing, sections of the state.

*Iron and steel, blast furnaces.*—The industry shows a decrease of 27 per cent in value of products from 1899 to 1904. During the period from 1904 to 1909, however, the industry felt the stimulating effect of the increased demand for pig iron, and with the development of extensive ore beds the industry has nearly recovered from the depression of 1904.

*Textiles.*—The textile industries of the state—consisting of the manufacture of cotton goods, hosiery and knit goods, and woolen and worsted goods—are important branches of the state's manufacturing interests. Combined, the three allied branches gave employment to an average of 7,849 wage earners during 1909, and the value of their products amounted to \$10,568,000, these figures representing 10.6 per cent and 5.9 per cent, respectively, of the corresponding totals for all manufacturing industries in the state.

Measured by value added by manufacture, only 5 of the 40 industries presented separately in the above table held the same rank as when measured by value of products. Interesting variations in this respect are shown for some of the industries. Printing and publishing and the flour and grist mills exchange places,

the former taking second place and the latter industry going to fourth place. The manufacture of patent medicines and compounds displaces the cottonseed-oil industry from sixth place, the latter industry dropping to eleventh place. Blast furnaces drop from eighth place in value of products to thirteenth in value added by manufacture. Still greater variations are shown for the leather, distilled-liquor, slaughtering and meat-packing, and malt-liquor industries.

Wherever comparative figures can be given, this table shows also the percentages of increase for these leading industries in value of products and value added by manufacture. During the five-year period, 1904 to 1909, the distillery, hosiery and knit-goods, and ice industries showed large increases in gross value of products as well as in value added by manufacture. Six of the industries listed separately, namely, the manufacture of carriages and wagons, the tanning and finishing of leather, and the coke, paint and varnish, lime, and canning and preserving industries showed decreases in value of products from 1904 to 1909, while 8 industries showed decreases during the same period in value added by manufacture. None of these decreases, however, occurred among the 10 leading industries in the state. From 1899 to 1904 there was only 1 industry which showed a decrease in value of products, but 7 showed a decrease in value added by manufacture.

**Persons engaged in manufacturing industries.**—The following table shows, for 1909, the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables is an estimate obtained by the method described in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
<b>All classes.....</b>	<b>87,672</b>	<b>77,277</b>	<b>10,395</b>
Proprietors and officials.....	8,393	8,252	141
Proprietors and firm members.....	5,415	5,303	112
Salaried officers of corporations.....	1,216	1,203	13
Superintendents and managers.....	1,762	1,746	16
Clerks.....	5,439	4,377	1,062
Wage earners (average number).....	73,840	64,648	9,192
16 years of age and over.....	71,395	63,016	8,379
Under 16 years of age.....	2,445	1,632	813

The average number of persons engaged in manufactures during 1909 was 87,672, of whom 73,840 were wage earners. Of the remainder, 8,393 were proprietors and officials and 5,439 were clerks. Corresponding figures for individual industries will be found in Table II, page 22.

The following table shows, for 1909, the percentage of proprietors and officials, clerks, and wage earners, respectively, among the total number of persons employed in manufactures. It covers all industries combined and 16 important industries individually:

INDUSTRY.	PERSONS ENGAGED IN MANUFACTURES.			
	Total number.	Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
<b>All Industries.....</b>	<b>87,672</b>	<b>9.6</b>	<b>6.2</b>	<b>84.2</b>
Bread and other bakery products.....	1,179	14.8	12.7	72.5
Carriages and wagons and materials.....	1,992	11.6	2.7	85.0
Cars and general shop construction and repairs by steam-railroad companies....	5,884	1.4	4.0	94.6
Clothing, men's, including shirts.....	1,892	5.3	10.4	84.4
Cotton goods, including cotton small wares.	3,164	1.6	1.1	97.3
Fertilizers.....	670	5.2	11.3	83.4
Flour-mill and gristmill products.....	2,658	31.2	9.5	59.3
Foundry and machine-shop products.....	4,694	6.4	7.5	86.1
Furniture and refrigerators.....	2,667	4.6	4.7	90.7
Hosiery and knit goods.....	3,229	1.9	1.5	96.5
Iron and steel, blast furnaces.....	1,268	3.8	6.1	90.1
Lumber and timber products.....	20,283	12.6	2.2	85.2
Oil, cottonseed, and cake.....	957	6.0	9.8	84.2
Patent medicines and compounds and druggists' preparations.....	998	13.7	42.9	43.4
Printing and publishing.....	4,442	15.1	10.3	65.6
Woolen, worsted, and felt goods, and wool hats.....	1,737	2.8	2.0	95.2
All other industries.....	23,958	8.9	7.7	83.4

Of the total number of persons engaged in all manufacturing industries, 9.6 per cent were proprietors and officials, 6.2 per cent clerks, and 84.2 per cent wage earners. In the flour-mill and gristmill industry the majority of the establishments are small and the work is to a large extent done by the proprietors or their immediate representatives, so that the proportion of persons engaged in this industry falling in the class of proprietors and officials is very much higher than for any other industry or for all industries combined. Similar conditions prevail to some extent in the lumber and timber products, bakery, and printing and publishing industries, and in the manufacture of patent medicines and compounds, and carriages and wagons. The small proportion of this class shown for the cotton-goods and the steam-railroad repair shop industries is due to the comparatively large number of wage earners employed.

The following table shows for 1909, in percentages, for all industries combined, the distribution of the average number of wage earners by age periods, and for those 16 years of age and over by sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries separately, a similar distribution of wage earners as reported for December 15, or the nearest representative day. As a means of judging the importance of the several industries the average number employed for the year is also given in each case.

INDUSTRY.	WAGE EARNERS.			
	Average number.	Per cent of total.		
		16 years of age and over.		Under 16 years of age.
		Male.	Female.	
All industries.....	73,840	85.3	11.3	3.3
Bread and other bakery products.....	855	71.9	26.1	2.0
Carriages and wagons and materials.....	1,706	99.1	0.2	0.6
Cars and general shop construction and repairs by steam-railroad companies.....	5,566	99.7	0.3	( <sup>2</sup> )
Clothing, men's, including shirts.....	1,596	19.2	79.1	1.7
Cotton goods, including cotton small wares.....	3,078	44.5	37.9	17.6
Fertilizers.....	559	100.0	.....	.....
Flour-mill and gristmill products.....	1,577	99.0	0.1	0.9
Foundry and machine-shop products.....	4,041	98.6	0.2	1.2
Furniture and refrigerators.....	2,419	91.4	2.8	5.8
Hosiery and knit goods.....	3,117	25.8	57.6	16.6
Iron and steel, blast furnaces.....	1,143	99.1	.....	0.9
Lumber and timber products.....	22,389	98.0	0.6	1.4
Oil, cottonseed, and cake.....	806	99.9	0.1	.....
Patent medicines and compounds and druggists' preparations.....	433	41.3	58.2	0.5
Printing and publishing.....	2,914	76.9	20.2	3.0
Woolen, worsted, and felt goods, and wool hats.....	1,654	44.6	44.7	10.8
All other industries.....	19,987	86.7	10.6	2.7

<sup>1</sup> For method of estimating the distribution, by sex and age periods, of the average number in all industries combined, see Introduction.  
<sup>2</sup> Less than one-tenth of 1 per cent.

For all industries combined, 85.3 per cent of the average number of wage earners were males 16 years of age and over, 11.3 per cent females 16 years of age and over, and 3.3 per cent children under 16 years of age. The larger part of the total number of female wage earners is made up of those employed in the men's clothing and the textile industries. In the men's clothing industry over three-fourths of the wage earners are women 16 years of age and over; in the cotton-goods industry, over one-third; in the hosiery and knit-goods industry, more than one-half; and in the woolen mills, a little less than one-half. The proportions which the number of children formed of the total number of wage earners engaged in each of the textile industries were as follows: Cotton goods, 17.6 per cent; hosiery and knit goods, 16.6 per cent; and woolen goods, 10.8 per cent.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904, it is necessary to use the classification employed at the earlier census. (See Introduction.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				
	1909		1904		Per cent of increase, 1904-1909.
	Number.	Percent distribution.	Number.	Percent distribution.	
Total.....	87,672	100.0	69,287	100.0	28.5
Proprietors and firm members.....	5,415	6.2	3,805	5.5	42.3
Salaried employees.....	8,417	9.6	4,910	7.1	71.4
Wage earners (average number).....	73,840	84.2	60,572	87.4	21.9

Comparable figures are not obtainable for 1899. Salaried employees show the greatest percentage of increase. Although the greatest actual gain in persons engaged in manufactures was in wage earners, this

class shows the smallest percentage of increase and is the only one which shows a decrease in relative numerical importance.

The next table shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over according to sex, for 1909, 1904, and 1899. The averages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Percent distribution.	Number.	Percent distribution.	Number.	Percent distribution.
Total.....	73,840	100.0	60,572	100.0	45,963	100.0
16 years of age and over.....	71,395	96.7	58,368	96.4	43,070	93.7
Male.....	63,016	85.3	51,757	85.4	39,095	85.1
Female.....	8,379	11.3	6,611	10.9	4,875	10.6
Under 16 years of age.....	2,445	3.3	2,204	3.6	1,993	4.3

This table shows that, while for all industries combined there were increases from 1899 to 1904 and from 1904 to 1909 in the number of children under 16 years of age employed, the proportion which the children form of the total number of wage earners has decreased from census to census. There has not been much change in the proportion of male and of female wage earners 16 years of age and over. In 1909 males 16 years of age and over formed 85.3 per cent of all wage earners, as compared with 85.4 per cent in 1904 and 85.1 per cent in 1899.

**Wage earners employed by months.**—The following table gives the number of wage earners employed on the 15th of each month during the year 1909, for all industries combined, for canning and preserving, for the lumber and timber and the cottonseed-oil industries, and for all other industries combined; it gives also the percentage which the number reported for each month is of the greatest number reported for any one month. In Table II, page 22, are shown for practically all of the important industries in the state, the largest number and the smallest number of wage earners reported for any month. The figures are for the 15th day, or the nearest representative day, of the month. The wage earners for the lumber industry are divided in the table so as to show separately the number employed in the mills and the number engaged in logging operations.

A little more than 30 per cent of the total average number of wage earners in all industries combined are employed in the lumber and timber industry, and the variation in the number of wage earners employed from month to month for all industries follows closely the variation in the number employed in that one industry. In the lumber mills the minimum number was reported for January. There was an increase from January to March, followed by a decrease from March to June, but from June to November, when the maximum number, 19,249, was employed, the number con-

MANUFACTURES—TENNESSEE.

stantly increased from month to month. In logging operations the least number was employed in May and the greatest in November. A greater variation occurred in the number of wage earners employed in the cottonseed-oil and the canning and preserving industries, but as the number employed was comparatively small, the fluctuation does not materially affect the total for all industries. As in the lumber and timber

industry, the maximum number in the cottonseed-oil mills was employed in November. The proportion of the maximum represented by the number reported for the summer months was very low. The canning and preserving industry is particularly seasonal in its character, the number employed varying from 3 in March, probably watchmen or caretakers, to 1,411 in August.

MONTH.	NUMBER OF WAGE EARNERS.													
	All industries.		Canning and preserving.		Lumber and timber products.						Oil, cottonseed, and cake.		All other industries.	
					Total.		In mills.		In logging operations.					
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January	69,305	85.0	10	0.7	20,020	81.0	16,110	83.7	4,510	72.6	1,306	93.7	47,399	88.1
February	69,074	86.7	10	0.7	20,963	82.3	16,481	85.6	4,482	72.1	1,144	82.1	47,857	89.0
March	71,073	88.1	3	0.2	21,771	85.5	17,265	89.7	4,506	72.5	918	65.9	48,381	89.9
April	70,666	87.6	11	0.8	21,485	84.4	16,961	88.1	4,524	72.8	523	37.5	48,647	90.4
May	69,713	86.4	15	1.1	20,969	82.4	16,646	86.5	4,323	69.6	457	32.8	48,272	89.7
June	70,123	86.0	15	1.1	20,651	81.1	16,241	84.4	4,410	71.0	213	15.3	49,244	91.5
July	71,155	88.2	361	25.0	21,080	82.8	16,406	85.2	4,674	75.2	180	13.3	49,528	92.1
August	74,959	92.0	1,411	100.0	22,180	87.1	16,850	87.5	5,330	85.9	206	14.8	51,150	95.1
September	78,850	97.7	1,243	88.1	23,065	94.1	18,217	94.6	5,748	92.5	685	49.1	52,057	98.4
October	80,011	99.2	504	35.7	24,080	98.1	18,873	98.0	6,107	98.3	1,363	97.8	53,164	98.8
November	80,670	100.0	25	1.8	25,462	100.0	19,240	100.0	6,213	100.0	1,394	100.0	53,795	100.0
December	79,587	98.0	25	1.8	24,537	96.4	19,055	99.0	5,482	88.2	1,280	91.8	53,745	99.9

Prevailing hours of labor.—In the next table wage earners have been classified according to the hours of labor prevailing in the establishments in which they are employed.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries	73,840	3,579	2,040	9,957	7,416	39,806	6,126	2,419	2,497
Agricultural implements	645	1		154		490			
Boots and shoes, including cut stock and findings	374			73	101	200			
Boxes, fancy and paper	202			21	87	94			
Bread and other bakery products	855	34	15	161	67	412	113	38	25
Brick and tile	1,281	28	27	43	51	1,017	26	78	11
Canning and preserving	303	30	31	16	20	130	51	25	
Carrriages and wagons and materials	1,706	102	89	100	201	1,211	1	2	
Cars and general shop construction and repairs by steam-railroad companies	5,586	218		4,305	887	14	142		
Clothing, men's, including shirts	1,500	103	205	423	551	314			
Coffins, burial cases, and undertakers' goods	480		88	13	156	223			
Coke	250	44		56		144	6		
Confectionery	804	4	8	18	373	428	55	8	
Cooperage and wooden goods, not elsewhere specified	856	29		3	25	709			
Copper, tin, and sheet-iron products	572	129	90	96	2	255			
Cotton goods, including cotton small wares	3,078			65		1,333	1,643	37	
Fertilizers	550	1			46	512			
Flour-mill and gristmill products	1,577	167	5	3		410	78	913	1
Foundry and machine-shop products	4,041	10	13	1,005	441	2,551	19	2	
Furniture and refrigerators	2,419		31	256	580	1,321	267	24	
Gas, illuminating and heating	422					1	81	103	237
Hosiery and knit goods	3,117				840	1,323	954		
Ice, manufactured	770	2				23	56	87	611
Iron and steel, blast furnaces	1,143					180		73	881
Leather goods	604	8	8	99	180	309			
Leather, tanned, curried, and finished	395	1			11	383			
Lime	415			18	32	218	66	41	49
Liquors, distilled	154	2		11		117		24	
Liquors, malt	392	182		124	111			25	
Lumber and timber products	22,389	729	704	826	933	17,073	1,177	46	1
Marble and stone work	1,006	80	6	188	23	434	246		29
Mattresses and spring beds	272	5	61	67	14	125			
Millinery and lace goods	92	5		72		15			
Oil, cottonseed, and cake	896							806	
Paint and varnish	71			4		67			
Patent medicines and compounds and druggists' preparations	433	46	70	90	175	50	2		
Pottery, terra-cotta, and fire-clay products	323	39				36	248		
Printing and publishing	2,914	1,140	386	782	262	335			
Slaughtering and meat packing	280	4		2		249		2	23
Stoves and furnaces, including gas and oil stoves	1,085	5	98	239	7	736			
Woolen, worsted, and felt goods, and wool hats	1,654	1			67	1,029	557		
All other industries	7,840	471	105	624	1,183	4,336	398	85	638

In making this classification the average number of wage earners employed during the year is used, and the number employed in each establishment is classified as a total according to the hours prevailing in that establishment, even though a few employees work a greater or less number of hours.

For more than one-half of the wage earners employed in the manufacturing industries of Tennessee the prevailing hours of labor are 60 a week. Nearly one-fourth of the total work from 54 to 60 hours a week; 7.6 per cent are employed in establishments where the prevailing hours are less than 54 a week; and 15 per cent in establishments where they are more than 60 a week.

It will be noted that the foundry and machine-shop, hosiery and knit-goods, furniture, and lumber and timber industries, as well as a number of others, are mainly on a 60-hour-per-week basis, but that the flour-mill and gristmill and the cottonseed-oil industries are largely on a 72-hour-per-week basis. In the majority of establishments engaged in the manufacture of ice and in the operation of blast furnaces wage earners are usually employed over 72 hours per week, these long hours being doubtless explained by the operation of the establishments on Sunday.

**Location of establishments.**—The next table shows the extent to which the manufactures of Tennessee are centralized in cities of 10,000 population and over. (See Introduction.) The population in 1900 was used as the basis in making the classification for 1904 as well as for 1899.

ITEM.	Year.	Total.	LOCATION OF ESTABLISHMENT.		PER CENT OF TOTAL.	
			In cities with population of 10,000 and over.	Outside districts.	In cities with population of 10,000 and over.	Outside districts.
Population.....	1910	2,184,789	338,198	1,846,591	15.5	84.5
	1900	2,020,616	260,487	1,760,129	12.9	87.1
Number of establishments.	1909	4,609	1,009	3,510	23.8	76.2
	1904	3,175	903	2,272	28.4	71.6
	1899	3,116	744	2,372	23.9	76.1
Average number of wage earners.	1909	73,840	28,236	45,604	38.2	61.8
	1904	60,572	26,093	34,479	43.1	56.9
	1899	45,963	23,302	22,661	50.7	49.3
Value of products...	1909	\$180,216,548	\$86,786,821	\$93,429,727	48.2	51.8
	1904	137,960,476	64,888,160	73,072,316	47.0	53.0
	1899	92,749,129	47,831,174	44,917,955	51.6	48.4
Value added by manufacture.	1909	76,200,714	36,729,504	39,471,210	48.2	51.8
	1904	58,608,730	28,309,310	30,299,411	48.3	51.7
	1899	38,190,090	20,259,432	17,930,658	53.0	47.0

In 1909, 48.2 per cent of the total value of products and 38.2 per cent of the average number of wage earners were reported from cities having over 10,000 inhabitants. While very little change took place during the last 10 years in the relative number of establishments in the cities of over 10,000 inhabitants and in the remainder of the state, the outside districts show a substantial increase over the cities in

the average number of wage earners employed, and smaller relative increase in value of products and in value added by manufacture.

The population for 1910 and 1900 of the five cities which had 10,000 inhabitants and over in 1910 is given in the following tabular statement:

CITY.	1910	1900
Memphis.....	131,105	102,320
Nashville.....	110,364	80,865
Chattanooga.....	44,004	30,154
Knoxville.....	36,346	32,637
Jackson.....	15,779	14,511

The relative importance in manufactures of these cities is shown in the following table, in which the value of products and average number of wage earners are shown separately for 1909, 1904, and 1899:

CITY.	AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.		
	1909	1904	1899	1909	1904	1899
Memphis <sup>1</sup> .....	7,027	7,374	6,020	\$30,241,519	\$20,043,192	\$14,233,483
Nashville <sup>1</sup> .....	6,721	8,032	6,726	29,649,697	21,567,013	15,301,096
Chattanooga <sup>1</sup> .....	6,410	6,420	4,720	16,036,455	14,201,390	10,517,886
Knoxville <sup>1</sup> .....	2,773	2,900	4,203	8,149,377	6,668,850	6,201,840
Jackson.....	1,405	1,208	1,018	2,709,773	2,317,715	1,576,800

<sup>1</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

Each city shows an increase in the value of products from 1899 to 1904 and from 1904 to 1909. During the period from 1904 to 1909 Memphis shows the greatest rate of gain and Chattanooga the smallest. In average number of wage earners Knoxville shows a decrease during each of the five-year periods, Chattanooga a slight decrease from 1904 to 1909, while the other three cities show increases for both periods.

Memphis, the largest city in the state, shows an increase in 1909, as compared with 1904, of \$10,198,327, or 50.9 per cent, in value of products, and of 553, or 7.5 per cent, in the average number of wage earners. The leading manufactures of this city are flour-mill and gristmill products, food preparations, lumber and timber products, cottonseed-oil and tobacco manufactures. In 1909, 65.5 per cent of the total value of cottonseed products manufactured in the state was reported from Memphis.

The increase in value of products for Nashville from 1904 to 1909 was \$8,082,684, or 37.5 per cent. The flour-mill and gristmill and printing and publishing industries of this city contributed 19.7 per cent and 45.8 per cent, respectively, of the total value of products of these industries in the state.

Chattanooga's chief industry was the manufacture of foundry and machine-shop products. Other important manufactures, however, were flour-mill and gristmill products, lumber, malt liquors, and furniture.

In Knoxville the flour-mill and gristmill industry was the most important, followed by the men's clothing

industry. Of the total value of men's clothing manufactured in the state in 1909, Knoxville reported 38.2 per cent. The lumber and timber industry and printing and publishing are other important industries.

The leading manufacturing industries of Jackson are the steam-railroad repair shops, foundries and machine shops, the lumber and timber industry, and the cottonseed-oil mills.

The statistics for that part of Bristol which lies in Tennessee are included with those for the outside district in the table on page 9. The table in the next column presents the totals for the entire city and for the parts situated in Tennessee and Virginia, respectively.

The leading industries of Bristol, Tenn., are the flour-mill and gristmill industry and the manufacture of dyestuffs and extracts, and those of Bristol, Va., are the flour-mills and gristmills, the manufacture of paper and wood pulp, the lumber and timber industry, and the steam-railroad repair shops.

	Total for city.	Bristol, Tenn.	Bristol, Va.
Population (1910).....	13,395	7,148	6,247
Number of establishments.....	51	23	28
Persons engaged in manufactures.....	1,310	377	933
Proprietors and firm members.....	42	22	20
Salaries employees.....	148	68	80
Wage earners (average number).....	1,129	287	842
Primary horsepower.....	3,914	1,289	2,625
Capital.....	\$3,062,409	\$1,345,671	\$1,716,738
Expenses.....	2,619,392	820,676	1,798,716
Services.....	631,813	160,327	471,486
Salaries.....	142,741	53,615	89,126
Wages.....	489,072	106,712	382,360
Materials.....	1,828,296	593,974	1,234,322
Miscellaneous.....	169,283	66,375	102,908
Value of products.....	2,848,777	878,100	1,970,668
Value added by manufacture (value of products less cost of materials).....	1,020,481	284,135	736,346

Character of ownership.—The table that follows presents conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>					<b>Foundry and machine-shop products, 1909.....</b>	124	4,041	\$9,189,791	\$4,029,591
1909.....	4,609	73,840	\$180,216,648	\$76,200,714	Individual.....	35	413	868,751	427,840
1904.....	3,175	60,572	137,960,476	58,608,730	Firm.....	20	150	352,709	214,384
Individual:					Corporation.....	69	3,469	7,968,271	3,987,404
1909.....	2,182	11,349	22,206,362	10,635,380	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	1,345	8,717	17,339,985	8,277,012	Individual.....	28.2	10.2	0.5	0.2
Firm:					Firm.....	23.4	3.0	3.8	4.5
1909.....	1,330	10,380	23,227,921	10,487,841	Corporation.....	48.4	85.8	96.8	89.1
1904.....	1,035	9,793	23,300,353	9,046,132	<b>Furniture and refrigerators, 1909.....</b>	42	2,419	\$3,309,385	\$1,801,512
Corporation:					Individual.....	7	222	194,084	125,184
1909.....	1,068	51,716	133,750,538	54,238,109	Firm.....	4	63	69,687	34,884
1904.....	785	42,049	97,286,790	40,362,147	Corporation.....	31	2,104	3,045,614	1,701,438
Other:					Per cent of total.....	100.0	100.0	100.0	100.0
1909.....	29	389	1,031,727	839,484	Individual.....	16.7	9.2	5.9	6.7
1904.....	10	13	34,339	23,439	Firm.....	9.5	3.8	2.1	1.9
Per cent of total:					Corporation.....	73.8	87.0	92.0	91.3
1909.....	100.0	100.0	100.0	100.0	<b>Lumber and timber products, 1909.....</b>	1,977	22,389	\$30,456,807	\$16,815,365
1904.....	100.0	100.0	100.0	100.0	Individual.....	1,101	6,676	6,690,074	4,141,337
Individual:					Firm.....	665	5,966	6,567,393	4,101,112
1909.....	47.3	15.4	12.3	14.0	Corporation.....	211	9,807	17,199,340	8,573,017
1904.....	42.4	14.4	12.6	14.1	Per cent of total.....	100.0	100.0	100.0	100.0
Firm:					Individual.....	55.7	29.8	22.0	24.2
1909.....	28.9	14.1	12.9	13.8	Firm.....	33.6	26.4	21.6	24.4
1904.....	32.6	16.2	16.9	17.0	Corporation.....	10.7	43.8	56.5	51.4
Corporation:					<b>Patent medicines and compounds and druggists' preparations, 1909.....</b>	76	433	\$3,514,676	\$2,173,870
1909.....	23.2	70.0	74.2	71.2	Individual.....	15	12	53,072	30,287
1904.....	24.7	69.4	70.5	68.9	Firm.....	15	194	1,778,181	1,201,959
Other:					Corporation.....	46	227	1,683,423	835,143
1909.....	0.6	0.5	0.6	1.1	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	0.3	(1)	(1)	(1)	Individual.....	19.7	2.8	1.5	1.7
<b>Carriages and wagons and materials, 1909.....</b>	129	1,766	\$3,039,813	\$1,000,187	Firm.....	19.7	44.8	50.6	53.3
Individual.....	46	284	404,778	216,434	Corporation.....	60.5	52.4	47.9	44.9
Firm.....	44	297	505,542	307,132	<b>Printing and publishing, 1909.....</b>	413	2,914	\$7,173,230	\$5,919,655
Corporation.....	39	1,125	2,129,293	1,076,621	Individual.....	208	429	793,011	694,188
Per cent of total.....	100.0	100.0	100.0	100.0	Firm.....	93	440	876,470	692,723
Individual.....	35.7	16.6	13.3	13.5	Corporation.....	84	1,663	4,488,645	3,188,829
Firm.....	34.1	17.4	16.0	16.2	Other.....	28	385	1,015,104	834,375
Corporation.....	30.2	65.9	70.1	67.3	Per cent of total.....	100.0	100.0	100.0	100.0
<b>Clothing, men's, including shirts, 1909.....</b>	34	1,596	\$3,361,105	\$1,238,595	Individual.....	50.4	14.0	11.1	11.4
Individual.....	6	21	51,069	25,111	Firm.....	22.5	15.1	12.2	11.7
Firm.....	8	481	993,241	392,690	Corporation.....	20.3	67.1	62.6	61.1
Corporation.....	20	1,094	2,316,195	820,794	Other.....	6.8	13.2	14.2	14.2
Per cent of total.....	100.0	100.0	100.0	100.0	<b>Slaughtering and meat packing, 1909.....</b>	27	280	\$2,056,719	\$446,609
Individual.....	17.6	1.3	1.5	2.0	Individual.....	11	43	306,031	77,625
Firm.....	23.5	30.1	29.6	31.7	Firm.....	9	26	256,410	82,365
Corporation.....	68.8	68.5	68.9	66.3	Corporation.....	7	211	1,494,278	286,609
<b>Flour-mill and gristmill products, 1909.....</b>	454	1,577	\$29,070,016	\$3,784,153	Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	208	859	5,493,218	891,518	Individual.....	40.7	15.4	14.9	17.4
Firm.....	187	361	5,870,094	987,150	Firm.....	33.3	9.3	12.5	18.6
Corporation.....	64	857	17,706,707	1,905,479	Corporation.....	25.9	75.4	72.7	64.0
Per cent of total.....	100.0	100.0	100.0	100.0					

<sup>1</sup> Less than one-tenth of 1 per cent.

In order to avoid disclosing the operations of individual concerns, it is necessary to omit several important industries from the preceding table and the one following.

The most important distinction shown is that between corporate and all other forms of ownership. For all industries combined, 23.2 per cent of the total number of establishments were in 1909 under corporate ownership, as against 76.8 per cent under all other forms. The corresponding figures for 1904 were 24.7 per cent and 75.3 per cent, respectively. The percentage of the total value of products contributed by establishments under corporate ownership increased from 70.5 per cent in 1904 to 74.2 per cent in 1909, while for the same period the percentage contributed by those under firm ownership decreased from 16.9 per cent to 12.9 per cent. The percentage of the value added by manufacture contributed by the establishments under corporate ownership increased from 68.9 per cent in 1904 to 71.2 per cent in 1909, while the percentage contributed by those under firm ownership decreased during the same period from 17 per cent to 13.8 per cent.

In four of the individual industries for which figures are given in the table, namely, the men's clothing industry, foundries and machine shops, the manufacture of furniture and refrigerators, and patent medicines and compounds, there was a larger number of establishments under corporate management than under any other. In every industry shown separately in the table, except the manufacture of patent medicines and compounds, the establishments operated by corporations contributed the greater part of the total value of products and of the total value added by manufacture.

**Size of establishment.**—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it, two tables are presented, which group establishments by value of products (page 12), and by number of wage earners (page 13).

**Size measured by value of products.**—The table on the next page shows, in addition to certain size groups, the average size of establishments as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the last two censuses, while for individual industries figures are given for 1909 only. In 1909, of the 4,609 establishments only 17, or four-tenths of 1 per cent, had a value of products exceeding \$1,000,000. These establishments, however, employed an average of 6,423 wage earners, or 8.7 per cent of the total number in all establishments, and reported 17 per cent of the total value of products, and 12.2 per cent of the total value added by manufacture.

On the other hand, the very small establishments—that is, those having a value of products of less than

\$5,000—constituted a very considerable proportion (45.2 per cent) of the total number of establishments, but the value of their products amounted to only 2.6 per cent of the total. The great bulk of the manufacturing was reported by establishments having products valued at not less than \$100,000.

It will be seen from the table on page 12 that during the five years from 1904 to 1909 there was an increase, when measured by value of products, in the relative importance of the large establishments—those reporting products valued at not less than \$100,000—and also in that of the very small establishments—those reporting products under \$5,000 in value. Establishments in each of these two classes gave employment to a larger proportion of the total number of wage earners, and reported a larger proportion of the total value of products and of the total value added by manufacture in 1909 than in 1904. Decreases are shown in the corresponding proportions for establishments reporting products of between \$5,000 and \$100,000 in value.

There was a general decrease in the average size of manufacturing establishments from 1904 to 1909. The average value of products per establishment decreased during the period from \$43,452 to \$39,101, the value added by manufacture from \$18,459 to \$16,533, and the average number of wage earners per establishment from 19 to 16.

Of the individual industries for which figures are given in the table, those in which the average size of the establishment as measured by value of products is smallest are the lumber and timber, and the printing and publishing industries. In each of these industries more than 60 per cent of the establishments reported products valued at less than \$5,000 for the year. The industries in which the establishments averaged the largest were the men's clothing, furniture and refrigerator, and slaughtering and meat-packing industries, in which 73.6 per cent, 64.3 per cent, and 59.2 per cent, respectively, of the establishments reported products valued at \$20,000 or over.

**Size measured by number of wage earners.**—In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The table on page 13 shows for 1909 such a classification for all industries combined and for 16 important industries individually, and gives not only the number of establishments falling in each group but also the average number of wage earners employed.

Of the 4,609 establishments reported for all industries, 6.6 per cent employed no wage earners; 54.3 per cent employed from 1 to 5; and 25.5 per cent from 6 to 20. The most numerous single group consists of the 2,505 establishments employing from 1 to 5 wage earners, and the next of the 1,174 establishments employing from 6 to 20. There were 153 establishments that

MANUFACTURES—TENNESSEE.

employed over 100 wage earners each, while 10 employed over 500 each, and one of them, a steam-railroad repair shop, employed over 1,000.

Of the total number of wage earners, 46 per cent were in establishments employing over 100 wage earners. The single group having the largest number of wage earners was the group comprising the establishments employing from 101 to 250 each. This group employed 17,173 wage earners, or 23.3 per cent of the

total. Of the individual industries listed in this table but not in the preceding one, steam-railroad repair shops, the cotton-goods, the hosiery and knit-goods, and the woolen-goods industries are conducted in comparatively large establishments, as appears from the classification according to the number of wage earners employed. The majority of the blast furnaces employ a relatively small number of wage earners.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>									
1909.....	4,609	73,840	\$180,216,548	\$78,200,714	<b>Foundry and machine-shop products, 1909.....</b>	124	4,041	\$9,189,791	\$4,629,591
1904.....	3,176	60,572	137,960,476	58,608,730	Less than \$5,000.....	29	52	72,293	46,655
Less than \$5,000:					\$5,000 and less than \$20,000.....	34	200	345,065	197,597
1909.....	2,082	5,541	4,640,418	3,058,539	\$20,000 and less than \$100,000.....	42	1,138	1,064,688	1,108,527
1904.....	1,015	1,784	2,607,791	1,766,725	\$100,000 and less than \$1,000,000 <sup>2</sup> .....	19	2,642	6,806,845	3,270,512
\$5,000 and less than \$20,000:					<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
1909.....	1,352	8,075	13,380,348	7,335,137	Less than \$5,000.....	23.4	1.3	0.8	1.0
1904.....	1,084	6,260	11,301,086	6,129,232	\$5,000 and less than \$20,000.....	27.4	5.2	3.8	4.3
\$20,000 and less than \$100,000:					\$20,000 and less than \$100,000.....	33.9	28.2	21.4	23.9
1909.....	789	15,379	34,700,071	15,749,778	\$100,000 and less than \$1,000,000 <sup>2</sup> .....	15.3	65.4	74.1	70.8
1904.....	766	16,318	33,535,276	15,427,691	Average per establishment.....		33	\$74,111	\$37,335
\$100,000 and less than \$1,000,000:					<b>Furniture and refrigerators, 1909.....</b>	42	2,419	\$3,309,385	\$1,861,512
1909.....	369	37,822	96,928,660	40,751,742	Less than \$5,000.....	3	7	6,672	5,259
1904.....	299	30,410	71,720,062	29,694,696	\$5,000 and less than \$20,000.....	12	99	120,911	70,018
\$1,000,000 and over:					\$20,000 and less than \$100,000.....	13	635	687,780	347,046
1909.....	17	6,423	30,597,045	9,305,518	\$100,000 and less than \$1,000,000.....	14	1,678	2,404,022	1,438,298
1904.....	11	5,791	18,796,261	5,590,380	<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
<b>Per cent of total:</b>					Less than \$5,000.....	7.1	0.3	0.2	0.3
1909.....	100.0	100.0	100.0	100.0	\$5,000 and less than \$20,000.....	28.6	4.1	3.7	3.8
1904.....	100.0	100.0	100.0	100.0	\$20,000 and less than \$100,000.....	31.0	26.2	20.8	18.0
Less than \$5,000:					\$100,000 and less than \$1,000,000.....	33.3	69.4	75.4	77.3
1909.....	46.2	7.5	2.6	4.0	Average per establishment.....		53	\$78,795	\$44,322
1904.....	32.0	2.9	1.9	3.0	<b>Lumber and timber products, 1909.....</b>	1,977	22,389	\$30,456,807	\$16,815,366
\$5,000 and less than \$20,000:					Less than \$5,000.....	1,198	4,085	2,572,282	1,771,690
1909.....	20.3	11.7	7.4	9.6	\$5,000 and less than \$20,000.....	536	4,961	4,956,787	3,177,175
1904.....	34.1	10.3	8.2	10.5	\$20,000 and less than \$100,000.....	174	4,505	7,316,344	3,975,519
\$20,000 and less than \$100,000:					\$100,000 and less than \$1,000,000.....	69	8,778	15,611,394	7,891,582
1909.....	17.1	20.8	19.3	20.7	<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
1904.....	24.1	20.9	24.3	26.3	Less than \$5,000.....	60.6	18.2	8.4	10.5
\$100,000 and less than \$1,000,000:					\$5,000 and less than \$20,000.....	27.1	22.2	16.3	18.9
1909.....	8.0	51.2	53.8	53.5	\$20,000 and less than \$100,000.....	8.8	20.4	24.0	23.7
1904.....	9.4	60.2	52.0	60.7	\$100,000 and less than \$1,000,000.....	3.5	39.2	51.3	47.0
\$1,000,000 and over:					Average per establishment.....		11	\$15,406	\$8,595
1909.....	0.4	8.7	17.0	12.2	<b>Patent medicines and com- pounds and druggists' pre- parations, 1909.....</b>	76	433	\$3,514,676	\$2,173,870
1904.....	0.3	0.6	13.6	0.5	Less than \$5,000.....	30	12	52,462	36,915
Average per establishment:					\$5,000 and less than \$20,000.....	23	59	239,750	161,394
1909.....	16		\$39,101	\$16,533	\$20,000 and less than \$100,000.....	18	117	982,421	531,720
1904.....	19		43,452	18,469	\$100,000 and less than \$1,000,000.....	5	245	2,240,043	1,443,811
<b>Carrriages and wagons and materials, 1909.....</b>	129	1,706	\$3,039,613	\$1,600,187	<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
Less than \$5,000.....	47	150	135,408	88,742	Less than \$5,000.....	39.5	2.8	1.5	1.7
\$5,000 and less than \$20,000.....	45	298	432,681	293,791	\$5,000 and less than \$20,000.....	30.3	13.0	6.8	7.4
\$20,000 and less than \$100,000.....	30	753	1,290,524	655,244	\$20,000 and less than \$100,000.....	23.7	27.0	28.0	24.5
\$100,000 and less than \$1,000,000.....	7	505	1,181,000	582,410	\$100,000 and less than \$1,000,000.....	6.6	56.6	63.7	66.4
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0	Average per establishment.....		6	\$46,246	\$28,604
Less than \$5,000.....	36.4	8.8	4.5	5.5	<b>Printing and publishing, 1909.....</b>	413	2,914	\$7,173,230	\$5,219,045
\$5,000 and less than \$20,000.....	34.9	17.5	14.2	16.5	Less than \$5,000.....	268	375	587,609	462,082
\$20,000 and less than \$100,000.....	23.3	44.1	42.5	41.6	\$5,000 and less than \$20,000.....	91	382	831,443	645,754
\$100,000 and less than \$1,000,000.....	5.4	29.6	38.9	36.4	\$20,000 and less than \$100,000.....	35	667	1,377,535	955,725
Average per establishment.....		13	\$23,563	\$12,405	\$100,000 and less than \$1,000,000.....	19	1,490	4,370,643	3,156,084
<b>Clothing, men's, including shirts, 1909.....</b>	34	1,598	\$3,361,105	\$1,238,595	<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
\$5,000 and less than \$20,000.....	9	53	83,333	37,395	Less than \$5,000.....	64.9	12.0	8.2	8.9
\$20,000 and less than \$100,000.....	14	426	760,659	340,784	\$5,000 and less than \$20,000.....	22.0	13.1	11.6	12.4
\$100,000 and less than \$1,000,000.....	11	1,117	2,517,113	864,416	\$20,000 and less than \$100,000.....	8.5	22.9	19.2	18.3
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0	\$100,000 and less than \$1,000,000.....	4.0	51.1	61.0	60.5
\$5,000 and less than \$20,000.....	26.5	3.3	2.5	3.0	Average per establishment.....		7	\$17,369	\$12,638
\$20,000 and less than \$100,000.....	41.2	26.7	22.6	28.0	<b>Slaughtering and meat pack- ing, 1909.....</b>	27	280	\$2,056,719	\$444,069
\$100,000 and less than \$1,000,000.....	32.4	70.0	74.9	69.0	Less than \$5,000.....	3	3	8,621	3,877
Average per establishment.....		47	\$98,856	\$36,429	\$5,000 and less than \$20,000.....	8	25	105,339	39,165
<b>Flour-mill and gristmill prod- ucts, 1909.....</b>	454	1,577	\$29,070,019	\$3,784,183	\$20,000 and less than \$100,000.....	12	101	507,223	169,130
Less than \$5,000.....	69	49	190,545	38,529	\$100,000 and less than \$1,000,000.....	4	151	1,435,536	247,497
\$5,000 and less than \$20,000.....	190	217	2,131,595	414,268	<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
\$20,000 and less than \$100,000.....	160	453	6,842,747	1,144,602	Less than \$5,000.....	11.1	1.1	0.4	0.9
\$100,000 and less than \$1,000,000.....	20	382	6,902,173	801,445	\$5,000 and less than \$20,000.....	29.6	8.9	5.1	8.1
\$1,000,000 and over.....	6	476	13,002,959	1,385,309	\$20,000 and less than \$100,000.....	44.4	36.1	24.7	35.6
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0	\$100,000 and less than \$1,000,000.....	14.8	53.9	69.8	55.4
Less than \$5,000.....	15.2	3.1	0.7	1.0	Average per establishment.....		10	\$76,175	\$16,541
\$5,000 and less than \$20,000.....	41.8	13.8	7.3	10.9					
\$20,000 and less than \$100,000.....	35.2	28.7	23.5	30.2					
\$100,000 and less than \$1,000,000.....	0.4	24.2	23.7	21.2					
\$1,000,000 and over.....	1.3	30.2	44.7	36.6					
Average per establishment.....		3	\$64,031	\$8,335					

<sup>1</sup> Includes the group "Less than \$5,000."

<sup>2</sup> Includes the group "\$1,000,000 and over."

INDUSTRY.	ESTABLISHMENTS EMPLOYING—									
	Total.	No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All industries.....	4,609	306	2,505	1,174	318	153	116	27	9	1
Bread and other bakery products.....	131	6	103	16	2	2	2			
Carriages and wagons and materials.....	120	2	65	43	12	6	1			
Cars and general shop construction and repairs by steam-railroad companies.....	17		2	3			4	5	2	1
Clothing, men's, including shirts.....	34	2	3	8	9	8	4			
Cotton goods, including cotton small wares.....	17				4	0	4	1	2	
Fertilizers.....	12		4	1	2	3	2			
Flour-mill and gristmill products.....	454	60	350	23	6	3	1			
Foundry and machine-shop products.....	124	3	43	40	16	12	7	3		
Furniture and refrigerators.....	42		10	5	10	8	1	1		
Hosiery and knit goods.....	22		1	3	2	4	9	2	1	
Iron and steel, blast furnaces.....	13				6	5	1	1		
Lumber and timber products.....	1,077	40	1,088	670	103	28	31	7	1	
Oil, cottonseed, and cake.....	20		1	2	11	5				
Patent medicines and compounds and druggists' preparations.....	76	17	43	12	3		1			
Printing and publishing.....	413	111	220	41	10	8	4	1		
Woolen, worsted, and felt goods, and wool hats.....	21	6	4	2	1	3	3	1	1	
All other industries.....	1,107	53	550	201	112	52	33	5	2	
AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	73,840	6,214	12,403	10,401	10,870	17,173	8,175	6,301	1,303	
Bread and other bakery products.....	855	232	105	64	135	250				
Carriages and wagons and materials.....	1,700	168	513	404	498	123				
Cars and general shop construction and repairs by steam-railroad companies.....	5,500	4	37			692	1,692	1,838	1,303	
Clothing, men's, including shirts.....	1,596	14	104	280	511	687				
Cotton goods, including cotton small wares.....	3,078			146	404	650	290	1,570		
Fertilizers.....	560	11	13	96	102	247				
Flour-mill and gristmill products.....	1,577	680	263	238	206	190				
Foundry and machine-shop products.....	4,041	104	504	498	831	960	1,144			
Furniture and refrigerators.....	2,410	36	65	352	582	1,133	251			
Hosiery and knit goods.....	3,117	5	48	70	258	1,385	688	603		
Iron and steel, blast furnaces.....	1,143			241	404	180	300			
Lumber and timber products.....	22,389	2,937	6,872	3,252	1,080	4,440	2,275	624		
Oil, cottonseed, and cake.....	806	2	23	340	305	136				
Patent medicines and compounds and druggists' preparations.....	433	80	108	75		161				
Printing and publishing.....	2,614	536	394	620	588	514	253			
Woolen, worsted, and felt goods, and wool hats.....	1,654	4	24	36	245	409	420	507		
All other industries.....	10,987	1,392	3,270	3,680	3,722	4,908	1,835	1,000		
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	100.0	8.4	16.8	14.1	14.7	23.3	12.4	8.5	1.8	
Bread and other bakery products.....	100.0	27.1	19.3	7.5	15.8	30.3				
Carriages and wagons and materials.....	100.0	9.8	30.1	23.7	20.2	7.2				
Cars and general shop construction and repairs by steam-railroad companies.....	100.0	0.1	0.7			12.4	30.4	33.0	23.4	
Clothing, men's, including shirts.....	100.0	0.9	0.5	17.5	32.0	43.0				
Cotton goods, including cotton small wares.....	100.0			4.7	13.1	21.1	0.7	51.3		
Fertilizers.....	100.0	2.0	2.3	17.2	34.3	44.2				
Flour-mill and gristmill products.....	100.0	43.1	16.7	15.1	13.1	12.0				
Foundry and machine-shop products.....	100.0	2.6	12.5	12.3	20.0	23.8	28.3			
Furniture and refrigerators.....	100.0	1.5	2.7	14.0	24.1	46.8	10.4			
Hosiery and knit goods.....	100.0	0.2	1.5	2.2	8.3	44.4	22.1	21.3		
Iron and steel, blast furnaces.....	100.0			21.1	35.3	16.5	27.0			
Lumber and timber products.....	100.0	13.1	30.7	14.5	8.9	10.8	10.2	2.8		
Oil, cottonseed, and cake.....	100.0	0.2	2.0	42.2	37.8	16.0				
Patent medicines and compounds and druggists' preparations.....	100.0	20.6	24.9	17.3		37.2				
Printing and publishing.....	100.0	18.4	13.5	21.6	20.2	17.6	8.7			
Woolen, worsted, and felt goods, and wool hats.....	100.0	0.2	1.5	2.2	14.8	24.7	25.0	30.7		
All other industries.....	100.0	7.0	16.4	18.4	18.6	25.0	9.2	5.5		

**Expenses.**—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses which make up the total.

The following table shows, for 1909, in percentages, the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II.

This table shows that, for all industries combined, 65.4 per cent of the total expenses was incurred for materials, 23.6 per cent for services—that is, salaries and wages—and 11 per cent for other purposes. As would be expected, these proportions vary greatly in the different industries.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries.....	5.8	17.8	65.4	11.0
Bread and other bakery products.....	5.3	14.9	71.0	8.8
Carriages and wagons and materials.....	0.3	27.3	56.6	9.8
Cars and general shop construction and repairs by steam-railroad companies.....	4.9	48.0	46.0	1.2
Clothing, men's, including shirts.....	10.0	12.9	68.4	8.7
Cotton goods, including cotton small wares.....	2.2	17.8	69.4	10.0
Fertilizers.....	4.8	7.2	74.5	13.5
Flour-mill and gristmill products.....	1.2	2.1	93.0	3.8
Foundry and machine-shop products.....	8.6	24.9	56.7	9.8
Furniture and refrigerators.....	8.6	20.9	48.3	13.1
Hosiery and knit goods.....	3.8	22.2	64.9	9.1
Iron and steel, blast furnaces.....	3.5	12.4	80.8	3.3
Lumber and timber products.....	5.3	28.0	54.8	11.9
Oil, cottonseed, and cake.....	3.4	4.8	86.4	5.5
Patent medicines and compounds and druggists' preparations.....	17.5	4.8	43.9	33.7
Printing and publishing.....	18.2	28.5	32.7	20.0
Woolen, worsted, and felt goods, and wool hats.....	4.2	24.0	64.5	7.3
All other industries.....	6.6	16.8	61.3	15.3

**Engines and power.**—The following table shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 <sup>1</sup>	1909	1904	1899 <sup>1</sup>	1909	1904	1899
<b>Primary power, total</b> .....	6,058	3,205	2,918	242,277	175,780	130,318	100.0	100.0	100.0
Owned.....	4,441	3,205	2,918	220,972	173,123	128,424	93.7	98.5	98.6
Steam.....	3,704	2,750	2,449	215,338	161,919	116,715	88.9	92.1	89.6
Gas.....	317	128	68	1,853	1,084	533	0.8	0.6	0.5
Water wheels.....	341	299	401	9,970	9,702	11,078	4.0	5.6	8.5
Water motors.....	19	22	( <sup>2</sup> )	107	233	( <sup>2</sup> )	( <sup>2</sup> )	0.1	( <sup>2</sup> )
Other.....				4	125	38	( <sup>2</sup> )	0.1	( <sup>2</sup> )
Rented.....	1,617	( <sup>2</sup> )	( <sup>2</sup> )	15,305	2,657	1,894	0.3	1.5	1.5
Electric.....	1,617	( <sup>2</sup> )	( <sup>2</sup> )	14,666	2,230	1,370	0.1	1.3	1.1
Other.....				639	427	524	0.3	0.2	0.4
<b>Electric motors</b> .....	2,579	186	46	29,586	6,586	2,193	100.0	100.0	100.0
Run by current generated by establishment.....	962	186	46	14,920	4,356	823	50.4	66.1	37.5
Run by rented power.....	1,617	( <sup>2</sup> )	( <sup>2</sup> )	14,666	2,230	1,370	49.6	33.9	62.5

<sup>1</sup> Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.  
<sup>2</sup> Not reported.  
<sup>3</sup> Less than one-tenth of 1 per cent.

The amount of primary power used in the manufacturing industries of Tennessee increased 34.9 per cent from 1899 to 1904, and 37.8 per cent from 1904 to 1909. This increase was chiefly in power generated by steam engines. From 1904 to 1909 the capacity of the steam engines increased 53,419 horsepower, or 33 per cent, yet the proportion which steam power formed of the total primary power decreased from 92.1 per cent in 1904 to 88.9 per cent in 1909. The horsepower of water wheels and water motors showed an

actual decrease. The more general use of gas engines is shown, the number and power of such engines reported in 1909 being 317 with 1,853 horsepower, as compared with 68 with 593 horsepower in 1899. The figures also show that the practice of renting electric power is on the increase, 14,666 horsepower, or 6.1 per cent of the total power reported in 1909, being rented electric power, as against 1,370 horsepower, or 1.1 per cent, in 1899. The use of electric motors for the purpose of applying the power generated within the establishments is also shown to be rapidly increasing, the horsepower of such motors having increased from 823 in 1899 to 14,920 in 1909.

**Fuel.**—Closely related to the question of kind of power employed is that of the fuel consumed in generating this power, or otherwise used as material in the manufacturing processes. The following table shows the quantity of each kind of fuel used in 1909 for all industries combined and for certain selected industries:

INDUSTRY.	An-thra-cite coal (tons).	Bitumi-nous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gaso-line (barrels).	Gas (1,000 feet).
<b>All industries</b> .....	14,115	1,681,458	691,282	94,287	65,108	15,809
Bread and other bakery products.....	853	3,238	2,861	4,634	61	1,786
Brick and tile.....		107,720	3,502	23,121	72	
Cars and general shop construction and repairs by steam-railroad companies.....		83,602	1,280		4,300	
Coke.....		495,965			21	
Cotton goods, including cotton small wares.....	831	46,599		2,258	9	
Flour-mill and gristmill products.....	80	86,636	230	17,620	930	
Foundry and machine-shop products.....	11	46,889	43,801	1,635	746	875
Furniture and refrigerators.....		15,757	4	255	12	
Gas, illuminating and heating.....		53,000	5,067		52,732	
Hosiery and knit goods.....		22,317				440
Ice, manufactured.....		99,165		856	129	
Iron and steel, blast furnaces.....		39,298	565,386	152	201	
Liquors, malt.....		32,070				
Lumber and timber products.....	500	49,190		1,281	728	
Oil, cottonseed, and cake.....		47,208		500		
Pottery, terra-cotta, and fire-clay products.....		40,564		210	2	
Printing and publishing.....	21	11,690	375	198	521	6,681
Woolen, worsted, and felt goods, and wool hats.....		26,591		2,873	10	
All other industries.....	11,819	376,024	67,807	38,694	4,628	6,027

<sup>1</sup> In addition there were 8,819 tons of other varieties of fuel reported.

**SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.**

(With statistics for laundries and custom sawmills and gristmills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and cost of materials and the quantity and value of products and other information, for securing which no provision is made on the general schedule. Certain data of this character for eight important industries in Tennessee are here presented.

**Lumber and timber products.**—The forests of Tennessee, containing an abundant growth of many of the most valuable species of forest trees, are among the best in the United States. Lumbering has long been an important industry in the state. As early as 1849 Tennessee had, including the custom sawmills, 451 establishments which reported a total value of products amounting to \$725,387.

The following statement gives the quantity of the various products of the sawmills reported at the censuses of 1909 and 1899:

PRODUCT.	QUANTITY.	
	1909	1899
Rough lumber.....	M feet b. m. 1,223,849	950,958
Lath.....	thousands.. 31,179	33,199
Shingles.....	thousands.. 35,692	59,735

The above table shows an increase of 272,891 M feet board measure, or 28.7 per cent, in the production of rough lumber. Eighty-three per cent of the total quantity of rough lumber sawed was hardwood, the

principal kind being oak, in the production of which Tennessee was the leading state in 1909, with approximately one-eighth of the total for the United States. The state was also first in the production of yellow poplar and hickory. Decreases are shown in the production of lath and shingles.

**Flour-mill and gristmill products.**—The following tabular statement gives the quantity and value of the different products of this industry for the last three census years:

PRODUCT.	1909	1904	1899
Total value.....	\$29,070,019	\$25,350,758	\$19,161,308
Wheat flour:			
White—			
Barrels.....	2,000,501	3,184,847	3,330,040
Value.....	\$17,218,710	\$17,015,408	\$12,500,493
Graham—			
Barrels.....	9,588	1,830	(1)
Value.....	\$48,076	\$8,715	(1)
Corn meal and corn flour:			
Barrels.....	1,081,746	2,052,765	2,002,032
Value.....	\$9,505,710	\$4,771,722	\$3,905,887
Rye flour:			
Barrels.....	5	40	113
Value.....	\$20	\$160	\$348
Buckwheat flour:			
Pounds.....	21,300	103,000	49,135
Value.....	\$1,020	\$2,830	\$1,026
Barley meal:			
Pounds.....		139,600	29,800
Value.....		\$1,948	\$435
Hominy and grits:			
Pounds.....	26,720,030	36,009,405	10,465,460
Value.....	\$441,371	\$421,299	\$164,348
Feed:			
Tons.....	64,150	31,909	43,032
Value.....	\$1,057,194	\$676,234	\$632,693
Offal:			
Tons.....	127,843	136,875	138,172
Value.....	\$3,180,436	\$2,442,060	\$1,734,492
All other products.....	\$7,873	\$9,512	\$41,070

<sup>1</sup> Not reported separately.

In 1909 the value of white flour constituted 59.2 per cent of the total value of products shown for the industry, and that of corn meal and corn flour, 22.4 per cent. From 1904 to 1909 there was a large increase in both the quantity and the value of feed reported, while for white-wheat flour, corn meal and corn flour, hominy and grits, and offal decreases in quantity were accompanied by increases in value.

**Printing and publishing.**—The following statement shows the number and circulation of the newspapers and periodicals published in the state as reported for 1909, 1904, and 1899:

PERIOD OF ISSUE.	NUMBER OF PUBLICATIONS.			AGGREGATE CIRCULATION PER ISSUE.		
	1909	1904	1899	1909	1904	1899
Total.....	330	334	258	5,601,541	3,157,803	3,181,017
Daily.....	16	17	16	245,658	183,050	166,718
Sunday.....	7	9	7	183,196	125,905	(1)
Semiweekly.....	10	3	6	16,925	8,720	7,700
Weekly.....	223	230	187	923,431	753,290	1,136,199
Monthly.....	49	33	28	517,643	247,143	270,150
All other classes.....	25	42	14	3,714,688	1,839,695	1,551,250

<sup>1</sup> Included in circulation for daily.

From 1904 to 1909 there has been a decrease of four in the total number of publications, the increase in the number of monthlies and semiweeklies being more than offset by the decrease in the number of dailies, Sunday publications, weeklies, and the publications shown under the head of "All other classes."

The number of dailies and of Sunday papers were the same in 1909 as shown for 1899.

The aggregate circulation per issue shows an increase of 77.4 per cent from 1904 to 1909, as compared with an increase of less than 1 per cent from 1899 to 1904. The weeklies increased in number but decreased in circulation from 1899 to 1904, while they decreased in number but increased in circulation from 1904 to 1909. The increase in the aggregate circulation of Sunday papers from 1904 to 1909 was 45.5 per cent. About three-fourths of the periodicals classified under the head of "All other classes" are published in Nashville. They are quarterly publications of various religious organizations and consist principally of Sunday-school quarterlies, lesson leaves, and papers. They show great gains in circulation at each census.

All the publications reported were printed in the English language, except two weeklies in German and two religious quarterlies in Spanish.

**Oil, cottonseed, and cake.**—This is one of the foremost industries of the state. The quantity of cotton seed crushed and the quantity of the resultant products, namely, oil, meal and cake, hulls, and linters, are shown in the following tabular statement for the last three census years:

MATERIAL OR PRODUCT.	QUANTITY.		
	1909	1904	1899
Cotton seed, crushed.....	170,475	143,479	168,307
Crude products, manufactured:			
Oil.....	7,525,409	5,730,599	6,454,173
Meal and cake.....	76,903	58,477	59,613
Hulls.....	59,434	53,738	79,858
Linters.....	8,533,484	5,918,496	4,058,473

The totals presented include the data for all cotton seed crushed and for the crude products manufactured, whether sold as such or used as intermediate products in further processes of manufacture, such as the refining of oil and the mixing of fertilizers and feed.

There was a decrease of 24,828 tons, or 14.8 per cent, in the amount of seed crushed in 1904, as compared with 1899, but this was more than offset by an increase of 35,996 tons, or 25.1 per cent, in the amount crushed in 1909, as compared with 1904.

The production of cottonseed oil decreased in 1904, as compared with 1899, 693,574 gallons, or 10.7 per cent, and increased in 1909, as compared with 1904, 1,764,810 gallons, or 30.6 per cent. The production of linters in 1909 was more than twice that reported for 1899, while that of hulls shows a decrease of 25.6 per cent.

Of the 20 cottonseed-oil mills reported as crushing seed in 1909, 1 crushed less than 1,000 tons, 4 crushed 2,000 but less than 5,000 tons, 8 crushed 5,000 but less than 10,000 tons, and 7 crushed 10,000 tons and over.

**Textiles.**—The growth of the textile industry, as a whole, is shown by the increase in the number of spindles, looms, and knitting machines. In the next table the number of each of the principal kinds of machines used at the last three censuses is shown.

MACHINE.	Cen- sus.	Total.	Cotton goods, including cotton small wares.	Hosiery and knit goods.	Woolen, worsted, and felt goods, and wool hats.
Producing spindles.....	1909	286,506	225,638	11,892	48,076
	1904	200,047	153,375	.....	46,672
	1899	161,921	123,896	.....	38,035
Looms.....	1909	5,143	4,233	.....	860
	1904	4,086	3,008	.....	1,078
	1899	4,234	2,995	.....	1,239
Knitting machines.....	1909	3,929	.....	3,929	.....
	1904	1,787	.....	1,787	.....
	1899	581	.....	581	.....
Woolen cards (sets).....	1909	82	.....	.....	82
	1904	82	.....	.....	82
	1899	99	.....	.....	99

The total number of producing spindles shows an increase from 1904 to 1909 of 86,459, or 43.2 per cent; of looms, an increase of 1,057, or 25.9 per cent; and of knitting machines, an increase of 2,142, or 119.9 per cent; while the number of woolen cards was the same for both years. In the cotton mills, where 78.8 per cent of the spindles and 83.3 per cent of the looms were used in 1909, the rates of increase for both kinds of machines were much greater from 1904 to 1909 than during the previous five years.

**Cotton goods, including cotton small wares.**—The manufacture of cotton goods is the most important of the textile industries in Tennessee, and shows a decided growth from census to census. The quantity and cost of the materials used, and the kind and value of the products reported at the last three censuses are given below:

MATERIAL OR PRODUCT.	1909	1904	1899
<b>Materials used, total cost.....</b>	<b>\$3,343,672</b>	<b>\$2,240,973</b>	<b>\$1,143,234</b>
Cotton:			
Pounds.....	28,312,077	10,292,275	15,040,336
Cost.....	\$2,941,040	\$2,045,800	\$984,300
Starch.....	\$8,085	\$10,554	\$6,000
Fuel and rent of power.....	\$103,111	\$55,654	\$39,823
All other materials.....	\$201,430	\$123,905	\$112,109
<b>Products, total value.....</b>	<b>\$5,200,791</b>	<b>\$3,560,934</b>	<b>\$1,994,935</b>
Brown or bleached sheetings and shirtings:			
Square yards.....	7,696,680	6,184,888	11,012,570
Value.....	\$435,958	\$341,530	\$501,576
Yarns, for sale:			
Pounds.....	7,443,170	5,062,404	2,000,083
Value.....	\$1,378,605	\$992,200	\$263,662
Cotton waste, for sale:			
Pounds.....	2,164,304	2,263,961	1,150,009
Value.....	\$56,954	\$84,322	\$22,769
All other products.....	\$3,320,184	\$2,142,872	\$1,206,028

In 1909, 28,312,077 pounds of cotton, all domestic, costing \$2,941,046, were consumed in this industry. This was an increase of 9,019,802 pounds, or 46.8 per cent, in quantity and of \$895,246, or 43.8 per cent, in cost over the figures for 1904. The industry shows a gain of 46 per cent in value of products from 1904 to 1909, as against a gain of 78.5 per cent from 1899 to 1904. The increase in value of products from 1904 to 1909 was due principally to the increase in the value of the cotton yarn produced for sale and the value of the products included under the head of "All other products." The principal items included under the latter

head are plain cloths for printing or converting, drills and duck. They are not shown separately, as to do so would disclose the output of individual establishments.

Both the quantity and the value of the output of brown or bleached sheetings and shirtings show increases over the figures for 1904, but the increases have not been large enough to counterbalance the decreases which took place from 1899 to 1904. While the quantity of yarn produced for sale in 1909 was 2,380,676 pounds, or 47 per cent, greater than in 1904 and their value \$386,435, or 38.9 per cent, greater, the increase was not as great as during the earlier five-year period when the increase in quantity was 153.1 and that in value 276.3 per cent.

**Hosiery and knit goods.**—The following tabular statement shows the quantity and cost of the different kinds of materials used and the quantity and value of the various products of the industry during the last three census years:

MATERIAL OR PRODUCT.	1909	1904	1899
<b>Materials used, total cost.....</b>	<b>\$2,120,225</b>	<b>\$969,196</b>	<b>\$248,050</b>
Cotton yarn purchased:			
Pounds.....	4,746,086	4,701,653	1,090,000
Cost.....	\$1,203,887	\$841,022	\$203,500
Chemicals and dyestuffs.....	\$121,614	\$40,915	\$21,500
Fuel and rent of power.....	\$42,916	\$18,146	\$1,600
All other materials.....	\$761,808	\$69,043	\$22,350
<b>Products, total value.....</b>	<b>\$3,565,436</b>	<b>\$1,627,323</b>	<b>\$395,150</b>
Hose:			
Dozens.....	2,420,817	1,155,692	183,500
Value.....	\$2,075,719	\$917,233	\$192,150
Half hose:			
Dozens.....	846,339	659,754	360,000
Value.....	\$770,547	\$368,792	\$203,000
All other products.....	\$719,170	\$341,798	.....

Cotton yarn purchased formed over four-fifths of the total cost of materials used in 1899 and 1904, but in 1909, when a few of the mills purchased the raw cotton and spun their own yarn, the cost of cotton yarn purchased formed less than three-fifths of the total.

From 1904 to 1909 the value of hose manufactured increased 126.3 per cent and that of half hose 108.9 per cent, while the output of the former increased 109.5 per cent and the output of the latter only 28.3 per cent. The average value of hose per dozen dropped from \$1.05 in 1899 to 79 cents in 1904, but advanced to 86 cents in 1909. The average value per dozen of half hose, on the other hand, advanced from 56 cents in 1899 and 1904 to 91 cents in 1909. In 1909 three establishments were engaged in manufacturing knit underwear, and although a large increase was shown in the value of products in 1909 as compared with 1904 the statistics are included under "All other products" in the table in order to avoid disclosing the operations of individual establishments.

**Woolen goods.**—With respect to value of products this industry is less important than either cotton goods or hosiery and knit goods. The larger part of the output is woolen goods for men's wear woven on cotton warp. The title of this industry, being uniform for all states, is "Woolen, worsted, and felt goods, and wool hats," but in Tennessee only woolen goods are made.

Iron and steel, blast furnaces.—The following is a tabular statement showing the quantity and value of products for 1909, 1904, and 1899:

PRODUCT.	1909	1904	1899
<b>Total value</b> .....	\$4,653,125	\$3,428,049	\$4,693,215
Pig iron:			
Tons.....	333,416	303,624	374,249
Value.....	\$4,644,667	\$3,426,932	\$4,693,215
<i>Classified by grades.</i>			
Foundry..... tons..	271,562	247,368	287,655
Forge or mill..... tons..	12,693	24,957	54,182
All other, including low phosphorus, Bessemer, ferro-silicon, ferro-phosphorus, white and mottled, and miscellaneous, and direct castings..... tons..	49,161	31,290	32,412
All other products.....	\$8,458	\$1,117	

This industry has been built up in the state by the working of the abundant deposits of ore and fuel found there. The value of products in 1909 was practically the same as in 1899, although from 1899 to 1904 there was a decrease of 27 per cent, due to the general business depression prevailing in 1904. The table shows a large decrease in that grade of pig iron classified as forge or mill. The average value per ton of pig iron was \$12.54 in 1899, \$11.29 in 1904, and \$13.93 in 1909.

Fertilizers.—The following tabular statement gives the quantity and value of products reported for this industry at the censuses of 1909, 1904, and 1899:

PRODUCT.	1909	1904	1899
<b>Total value</b> .....	\$3,249,343	\$2,700,561	\$1,466,288
Superphosphates from minerals, bones, etc.:			
Tons.....	25,322	20,410	35,959
Value.....	\$244,278	\$308,284	\$450,568
Complete fertilizers:			
Tons.....	130,343	83,370	36,605
Value.....	\$2,776,372	\$1,596,764	\$704,220
Other fertilizers:			
Tons.....	14,601	46,707	20,400
Value.....	\$213,464	\$755,964	\$304,000
Sulphuric acid:			
Tons.....	806	5,000	
Value.....	\$5,197	\$30,000	
All other products.....	\$10,032	\$0,549	\$1,500

Complete fertilizers formed the largest single product at each census. Their value from census to census has composed an increasing proportion of the total value of products for the industry, and in 1909 formed more than five-sixths of this total. Superphosphates from minerals, and "other fertilizers" show decreases both in quantity and in value during the period 1904-1909, the principal cause of which is the more general use in this industry in Tennessee of phosphate rock, pyrites, and kainit. The quantity and value of sulphuric acid sold in 1909 was only about one-sixth of that sold in 1904.

Laundries.—Statistics for steam laundries are not included in the general tables, or in the totals for manufacturing industries. In 1909 there were 63 such establishments in the state of Tennessee, 10 of which were in Nashville, 8 in Memphis, 7 in Knoxville, 6 in Chattanooga, and 3 in Jackson.

The three most common forms of ownership—the individual, firm, and corporate—were about equally represented in the industry, the first two reporting 22 establishments each and the corporate form 19 establishments. Twelve establishments had receipts for the year's business of less than \$5,000; 29, \$5,000 but

less than \$20,000; 19, \$20,000 but less than \$100,000; and 3, receipts in excess of \$100,000.

The following statement summarizes the statistics:

Number of establishments.....	63
Persons engaged in the industry.....	2,392
Proprietors and firm members.....	68
Salaried employees.....	175
Wage earners (average number).....	2,149
Primary horsepower.....	1,863
Capital.....	\$1,283,583
Expenses.....	1,340,732
Services.....	811,213
Materials.....	297,691
Miscellaneous.....	231,828
Amount received for work done.....	1,643,407

The average number of wage earners employed each month and the percentage which this number represented of the greatest number employed in any one month were as follows:

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	2,041	90.9	July.....	2,236	90.6
February.....	2,030	90.8	August.....	2,246	100.0
March.....	2,050	91.7	September.....	2,183	97.2
April.....	2,130	94.8	October.....	2,189	97.5
May.....	2,117	94.3	November.....	2,171	96.7
June.....	2,100	97.8	December.....	2,177	96.9

The different kinds of primary power, the number of engines or motors, and the horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines or motors.	Horsepower.
<b>Primary power, total</b> .....		1,863
Owned:		
Steam.....	64	1,707
Gas.....	1	5
Rented—Electric.....	39	61

The kind and amount of fuel used are shown in the following statement:

KIND.	Unit.	Quantity.
Bituminous coal.....	Tons.....	20,395
Coke.....	Tons.....	313
Wood.....	Cords.....	12
Oil.....	Barrels.....	94
Gas.....	1,000 feet.....	9,108

Custom sawmills and gristmills.—Statistics for custom sawmills and gristmills are not included in the general tables or in the totals for manufacturing industries, but are presented in the following summary:

	Custom sawmills.	Custom gristmills.
Number of establishments.....	226	1,068
Persons engaged in industry.....	918	1,938
Proprietors and firm members.....	321	1,403
Salaried employees.....	3	2
Wage earners (average number).....	594	533
Primary horsepower.....	4,475	16,587
Capital.....	\$237,331	\$967,643
Expenses.....	108,017	2,295,827
Services.....	87,980	55,368
Materials.....	6,027	12,210,809
Miscellaneous.....	14,030	27,650
Value of products.....	233,204	12,648,200

<sup>1</sup> Includes estimate of all grain ground. A similar estimate for value of lumber sawed by custom sawmills is impracticable.

MANUFACTURES—TENNESSEE.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.  
THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaries and employ-ees.	Wage earners (average number).							
STATE—All industries.....	1909	4,600	87,672	5,415	8,417	73,840	242,277	\$167,924	\$9,186	\$28,252	\$104,016	\$180,217	\$76,201
	1904	3,175	69,287	3,805	4,910	60,572	175,780	102,439	5,080	22,806	79,352	137,960	58,608
	1899	3,118	.....	.....	3,329	45,963	130,318	63,141	3,048	14,728	54,569	92,749	38,189
Agricultural implements.....	1909	16	712	9	58	645	1,236	1,466	80	268	413	1,004	321
	1904	12	656	9	34	613	757	757	51	216	314	769	455
	1899	11	422	11	38	373	568	418	35	113	202	403	261
Boots and shoes, including cut stock and findings.....	1909	4	427	7	46	374	174	532	70	118	827	1,181	354
	1904	4	246	5	16	225	200	174	10	78	640	837	197
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boxes, fancy and paper.....	1909	6	227	3	22	202	114	148	27	58	122	258	136
	1904	6	201	3	11	187	70	84	9	46	104	196	92
	1899	6	196	7	15	174	.....	64	11	33	63	132	131
Bread and other bakery products.....	1909	131	1,170	150	174	855	645	1,260	132	376	1,700	2,822	1,162
	1904	81	767	95	69	603	316	1,204	58	237	1,021	1,974	654
	1899	76	531	96	75	360	.....	666	37	158	683	1,103	429
Brick and tile.....	1909	91	1,487	112	94	1,281	4,631	1,868	82	443	346	1,308	962
	1904	84	1,410	108	68	1,234	3,165	1,200	65	378	205	1,100	805
	1899	91	1,307	121	34	1,152	2,821	891	31	293	166	685	519
Canning and preserving.....	1909	37	375	45	27	303	450	274	11	30	131	206	75
	1904	16	231	16	12	263	360	90	10	30	151	242	59
	1899	11	161	19	16	116	75	36	2	15	38	72	15
Carriages and wagons and materials.....	1909	120	1,092	150	136	1,706	4,537	3,006	160	693	1,439	3,040	1,663
	1904	97	2,148	109	160	1,889	4,408	2,617	158	750	1,668	3,278	1,619
	1899	95	.....	.....	77	1,157	.....	1,138	71	305	780	1,692	912
Cars and general shop construction and repairs by steam-railroad companies.....	1909	17	5,884	.....	318	5,566	5,145	4,035	320	3,252	3,116	6,777	3,661
	1904	16	4,939	.....	179	4,760	1,904	2,029	173	2,017	2,078	5,839	2,563
	1899	16	2,882	.....	65	2,817	1,341	1,320	59	1,450	1,528	3,113	1,585
Clothing, men's, including shirts.....	1909	34	1,892	34	262	1,596	503	2,257	309	402	2,123	3,301	1,258
	1904	32	2,154	44	142	1,968	656	1,324	153	413	1,877	3,069	1,192
	1899	31	.....	81	1,584	.....	.....	839	74	350	1,019	1,760	744
Coffins, burial cases, and undertakers' goods.....	1909	8	570	.....	90	480	976	1,138	130	201	522	1,189	667
	1904	8	482	.....	52	430	712	864	83	185	349	923	504
	1899	10	342	3	52	287	.....	440	68	118	329	625	299
Coke.....	1909	8	270	.....	20	250	370	858	14	87	478	586	168
	1904	9	416	.....	39	377	495	733	24	129	611	810	199
	1899	8	499	.....	22	477	605	607	14	128	523	765	232
Confectionery.....	1909	31	1,086	23	160	894	1,154	1,504	177	276	1,657	2,520	863
	1904	25	695	19	116	560	313	100	181	901	1,873	1,973	912
	1899	16	.....	68	337	.....	.....	372	54	101	424	814	361
Cooperage and wooden goods, not elsewhere specified.....	1909	19	913	18	39	850	2,209	1,443	50	253	629	1,148	519
	1904	25	424	29	19	376	884	346	19	134	481	792	241
	1899	34	.....	13	539	.....	.....	230	13	170	277	472	255
Copper, tin, and sheet-iron products.....	1909	57	704	73	59	572	154	673	70	201	593	1,229	600
	1904	35	404	49	32	383	150	299	25	204	435	871	400
	1899	24	.....	10	224	.....	.....	207	13	86	157	352	195
Cotton goods, including cotton small wares.....	1909	17	3,164	3	83	3,078	11,129	7,454	105	867	3,344	5,201	1,807
	1904	16	2,362	2	60	2,294	8,801	5,113	80	531	2,241	3,661	1,309
	1899	17	2,158	3	47	2,108	5,625	3,768	54	423	1,143	1,996	822
Fertilizers.....	1909	12	670	12	90	559	2,152	4,106	137	204	2,122	3,249	1,117
	1904	10	854	6	67	781	1,970	3,381	98	210	1,712	2,791	969
	1899	5	492	4	45	443	.....	950	40	94	790	1,466	656
Flour-mill and gristmill products.....	1909	454	2,658	663	418	1,577	27,176	8,511	323	559	25,286	29,070	3,784
	1904	387	2,429	584	250	1,595	23,441	6,927	212	601	21,912	25,351	3,639
	1899	362	.....	217	1,055	.....	.....	4,997	192	590	16,323	19,161	2,808
Foundry and machine-shop products.....	1909	124	4,094	102	551	4,041	7,488	9,253	695	2,006	4,560	9,190	4,639
	1904	100	3,716	85	318	3,313	5,295	4,616	345	1,482	2,854	6,124	3,276
	1899	104	.....	182	3,353	.....	.....	3,817	107	1,298	2,284	4,043	2,359
Furniture and refrigerators.....	1909	42	2,667	15	233	2,419	3,758	3,497	258	807	1,448	3,300	1,561
	1904	40	2,781	25	149	2,610	3,623	2,780	158	923	1,409	3,238	1,822
	1899	20	.....	75	1,068	.....	.....	1,003	71	318	653	1,188	565
Gas, illuminating and heating.....	1909	11	530	4	104	422	613	9,370	98	164	357	1,282	305
	1904	11	412	4	50	358	624	2,185	58	127	204	830	628
	1899	11	267	.....	40	218	.....	2,304	41	65	135	572	407
Hosiery and knit goods.....	1909	22	3,229	2	110	3,117	2,758	3,055	125	724	2,120	3,665	2,443
	1904	16	1,855	4	41	1,810	1,052	1,160	21	341	909	1,928	659
	1899	4	523	.....	12	511	212	217	16	73	249	395	166
Ice, manufactured.....	1909	57	986	46	161	779	9,327	2,748	154	362	281	1,324	1,665
	1904	37	487	26	79	382	6,812	1,125	67	101	123	684	561
	1899	27	472	20	97	385	3,589	1,104	50	177	110	538	428
Iron and steel, blast furnaces.....	1909	13	1,268	.....	125	1,143	18,150	7,122	147	510	3,381	4,653	1,222
	1904	13	1,480	.....	128	1,368	21,011	5,688	128	540	2,006	3,428	1,319
	1899	13	1,845	1	81	1,768	13,350	5,252	103	459	3,109	4,693	1,324

<sup>1</sup> Figures can not be shown without disclosing individual operations.  
<sup>2</sup> Excluding statistics for two establishments, to avoid disclosure of individual operations.

MANUFACTURES—TENNESSEE.

19

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaries employees.	Wage earners (average number).							
Expressed in thousands.													
<b>STATE—Continued.</b>													
Leather goods.....	1909	47	808	47	157	604	344	\$1,419	\$141	\$243	\$1,313	\$2,139	\$826
	1904	36	852	32	91	729	208	921	87	258	966	1,787	821
	1899	34	.....	.....	60	533	.....	540	51	198	653	1,122	469
Leather, tanned, curried, and finished.....	1909	25	463	26	42	305	1,684	3,564	50	130	1,994	2,530	536
	1904	29	804	28	40	736	1,731	4,013	64	252	2,851	3,684	733
	1899	44	887	55	29	803	804	3,444	35	240	2,184	2,802	618
Lime.....	1909	20	461	19	27	415	668	282	30	130	93	323	230
	1904	17	456	22	18	416	605	278	18	118	121	326	205
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Liquors, distilled.....	1909	39	239	40	45	154	1,205	1,308	44	53	305	2,256	1,861
	1904	50	207	60	15	132	803	882	17	55	256	568	312
	1899	51	205	55	11	139	700	500	8	43	200	940	740
Liquors, malt.....	1909	5	450	2	56	392	3,005	2,263	122	238	653	2,044	1,391
	1904	4	408	1	50	357	1,774	2,339	94	162	437	1,832	1,395
	1899	4	320	1	31	288	1,270	1,278	52	130	262	1,175	913
Lumber and timber products.....	1909	1,977	26,283	2,683	1,211	23,389	83,382	30,169	1,325	6,966	13,641	30,457	16,816
	1904	1,122	10,705	1,605	823	17,277	52,831	20,431	800	6,456	11,590	26,864	15,274
	1899	1,204	.....	.....	510	14,300	.....	11,056	418	4,380	9,327	10,166	9,830
Marble and stone work.....	1909	81	1,180	88	95	1,006	2,781	1,476	88	515	480	1,465	985
	1904	32	759	40	20	681	1,204	648	30	331	339	944	605
	1899	54	.....	.....	68	685	.....	600	36	241	215	845	630
Mattresses and spring beds.....	1909	17	352	20	60	272	1,000	513	52	104	362	656	294
	1904	12	270	21	21	237	217	212	17	72	216	436	220
	1899	10	.....	.....	14	107	.....	81	10	32	181	263	82
Millinery and lace goods.....	1909	6	154	8	54	92	4	56	20	26	101	202	101
	1904	4	81	6	2	73	5	37	1	27	101	181	80
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oil, cottonseed, and cake.....	1909	29	957	4	147	806	7,472	3,731	202	290	5,201	6,593	1,392
	1904	29	819	.....	118	701	6,606	2,914	138	246	3,084	3,744	660
	1899	17	833	2	80	761	4,460	1,997	105	204	2,278	2,980	702
Paint and varnish.....	1909	0	117	1	45	71	1,045	408	52	37	238	397	159
	1904	4	91	1	14	76	295	224	25	30	288	481	193
	1899	5	56	3	8	45	122	74	11	18	89	151	62
Patent medicines and compounds and druggists' preparations.....	1909	76	998	52	513	433	418	2,225	535	148	1,341	3,515	2,174
	1904	<sup>a</sup> 47	739	28	222	489	364	1,317	228	143	901	2,789	1,888
	1899	<sup>a</sup> 28	.....	.....	115	399	.....	730	137	138	525	1,504	979
Pottery, terra-cotta, and fire-clay products.....	1909	6	354	3	28	323	678	357	32	126	110	328	218
	1904	8	318	7	14	297	535	186	19	128	79	309	230
	1899	18	330	15	15	300	577	172	12	91	74	260	186
Printing and publishing.....	1909	413	4,442	443	1,085	2,914	2,995	6,493	1,085	1,701	1,954	7,173	5,219
	1904	340	3,373	386	857	2,330	1,913	4,415	667	1,323	1,323	5,091	3,768
	1899	<sup>a</sup> 284	.....	.....	500	1,788	.....	3,602	432	821	882	3,455	2,573
Slaughtering and meat packing.....	1909	27	379	<sup>a</sup> 31	68	280	1,242	2,516	61	140	1,610	2,057	447
	1904	<sup>a</sup> 12	81	13	9	59	936	408	9	23	275	377	192
	1899	13	.....	.....	15	166	.....	680	17	66	1,480	1,712	233
Stoves and furnaces, including gas and oil stoves.....	1909	17	1,242	7	150	1,085	1,380	1,827	140	519	717	1,951	1,234
	1904	10	870	7	53	819	830	1,158	60	404	349	1,116	767
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Woolen, worsted, and felt goods, and wool hats.....	1909	21	1,737	21	62	1,654	2,371	2,515	73	419	1,127	1,802	675
	1904	27	1,481	22	44	1,415	2,590	2,310	54	327	945	1,705	701
	1899	51	1,725	20	64	1,632	.....	2,400	68	294	874	1,517	643
All other industries.....	1909	466	9,463	440	1,174	7,840	25,094	31,144	1,445	3,430	15,601	26,787	11,186
	1904	321	6,349	304	806	5,430	16,410	14,314	639	1,995	9,343	15,797	6,454
	1899	301	.....	.....	456	3,526	.....	5,249	423	1,116	4,393	8,058	3,695

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

MEMPHIS—All industries.....	1909	329	9,937	597	1,413	7,927	21,320	\$26,868	\$1,727	\$4,288	\$17,851	\$30,242	\$12,391
	1904	289	8,448	269	895	7,374	.....	13,296	994	3,543	11,338	20,045	8,705
	1899	223	.....	.....	452	6,626	.....	8,767	552	2,792	7,879	14,233	6,354
Bread and other bakery products.....	1909	31	515	32	62	421	312	736	68	202	864	1,452	588
	1904	27	327	32	20	266	.....	528	29	113	440	787	341
	1899	21	216	24	35	157	.....	471	19	75	459	609	210
Carriages and wagons and materials.....	1909	16	421	14	33	374	714	952	48	200	386	882	490
	1904	15	520	8	33	479	.....	838	53	262	466	971	505
	1899	11	296	8	13	275	.....	403	20	113	206	452	240

<sup>1</sup> Not reported separately.

<sup>2</sup> Figures can not be shown without disclosing individual operations.

<sup>3</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.

<sup>4</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

## MANUFACTURES—TENNESSEE.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salariat employees.	Wage earners (average number).							
Expressed in thousands.													
<b>MEMPHIS—Continued.</b>													
Clothing, men's, including shirts.....	1909	7	58	7	5	46	27	\$62	\$6	\$16	\$75	\$163	\$88
	1904	9	240	16	27	197	.....	142	28	37	263	487	194
	1899	12	.....	.....	1	428	.....	213	2	120	274	528	254
Confectionery.....	1909	9	373	4	72	297	62	422	75	123	830	1,128	268
	1904	7	218	2	30	186	.....	206	30	82	442	840	407
	1899	4	.....	.....	5	57	.....	45	4	22	88	147	59
Cooperage and wooden goods, not elsewhere specified.	1909	4	428	2	13	413	1,166	901	20	123	310	557	247
	1904	5	223	4	8	211	.....	202	10	80	269	379	110
	1899	3	70	3	4	72	.....	20	4	39	80	162	66
Copper, tin, and sheet-iron products.....	1909	14	140	19	7	114	5	130	7	68	111	242	131
	1904	11	125	16	.....	109	.....	85	.....	77	129	292	161
	1899	7	.....	.....	.....	60	.....	30	.....	32	34	110	76
Foundry and machine-shop products.....	1909	18	519	12	70	437	1,557	1,086	82	284	565	1,130	565
	1904	15	512	13	53	446	.....	743	68	256	372	881	509
	1899	15	897	20	23	764	.....	1,071	33	351	490	1,079	583
Ice, manufactured.....	1909	6	308	1	35	272	1,726	842	48	154	80	405	415
	1904	4	210	.....	31	170	.....	437	32	110	40	310	270
	1899	4	217	.....	25	102	.....	545	31	103	45	290	215
Leather goods.....	1909	9	96	8	24	64	54	147	17	39	151	262	111
	1904	5	69	4	5	60	.....	71	6	27	116	171	55
	1899	5	.....	.....	.....	110	.....	183	.....	60	159	278	119
Lumber and timber products.....	1909	18	1,288	17	145	1,126	3,250	2,855	220	563	1,504	2,830	1,326
	1904	16	1,041	11	85	945	.....	1,872	111	421	1,059	1,917	858
	1899	20	.....	.....	73	1,625	.....	1,984	96	599	1,237	2,468	1,264
Marble and stone work.....	1909	8	122	11	4	107	125	139	3	84	53	216	163
	1904	3	110	5	3	102	.....	121	2	61	36	121	85
	1899	4	83	6	1	76	.....	101	1	46	43	187	144
Oil, cottonseed, and cake.....	1909	9	500	4	77	419	3,962	2,261	117	161	3,509	4,316	897
	1904	11	559	.....	74	485	.....	2,196	101	181	2,261	2,681	430
	1899	9	636	.....	40	587	.....	1,550	72	159	1,821	2,271	450
Patent medicine and compounds and druggists' preparations.	1909	21	146	15	61	70	17	304	47	20	360	639	279
	1904	8	58	4	12	42	.....	128	10	14	174	374	200
	1899	5	48	6	9	33	.....	72	18	14	78	226	148
Printing and publishing.....	1909	45	815	68	231	516	622	1,183	242	407	520	1,793	1,273
	1904	46	640	61	156	423	.....	668	100	278	382	1,322	910
	1899	27	432	20	78	325	.....	441	90	173	208	776	508
All other industries.....	1909	114	4,208	383	574	3,251	7,721	14,948	727	1,835	8,533	14,137	5,604
	1904	107	3,596	93	259	3,244	.....	4,969	324	1,544	4,853	8,591	3,648
	1899	76	.....	.....	136	1,866	.....	2,629	162	868	2,645	4,600	1,955
<b>NASHVILLE—All industries.....</b>													
	1909	384	11,888	368	1,794	9,721	19,538	\$27,880	\$1,862	\$4,836	\$17,456	\$20,650	\$12,194
	1904	287	9,866	255	1,099	8,032	.....	15,601	1,110	3,224	12,482	21,567	9,085
	1899	237	.....	.....	911	8,728	.....	11,874	786	2,276	9,027	15,301	6,274
Bread and other bakery products.....	1909	23	122	25	10	87	65	83	10	49	203	316	133
	1904	14	157	16	22	119	.....	533	17	45	204	586	378
	1899	16	119	19	27	73	.....	77	12	36	91	169	78
Carriages and wagons and materials.....	1909	17	226	22	11	193	148	131	12	96	158	337	179
	1904	11	202	14	20	168	.....	105	15	81	160	319	150
	1899	9	.....	.....	5	111	.....	73	5	47	65	166	101
Cars and general shop construction and repairs by steam-railroad companies.	1909	3	1,388	.....	60	1,328	630	1,012	68	707	678	1,576	896
	1904	3	1,466	.....	39	1,427	.....	619	47	743	890	1,724	814
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clothing, men's, including shirts.....	1909	5	466	12	56	398	127	445	73	112	522	836	314
	1904	7	594	18	48	528	.....	364	53	121	424	708	344
	1899	8	518	15	37	466	.....	275	31	90	367	504	227
Confectionery.....	1909	11	334	10	41	283	131	324	35	63	315	454	159
	1904	9	267	7	65	195	.....	203	52	50	243	583	345
	1899	5	.....	.....	55	166	.....	276	42	49	262	425	223
Cooperage and wooden goods, not elsewhere specified.	1909	4	96	3	9	84	150	98	10	34	130	190	51
	1904	5	86	2	5	70	.....	75	5	31	164	216	52
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Copper, tin, and sheet-iron products.....	1909	12	96	16	12	68	16	115	8	30	75	160	85
	1904	4	67	3	5	59	.....	45	4	37	44	114	59
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Flour-mill and gristmill products.....	1909	10	309	16	50	243	2,227	947	51	89	4,888	5,710	831
	1904	4	216	2	36	178	.....	752	41	86	3,600	4,242	582
	1899	4	225	2	45	178	.....	922	47	91	3,424	3,907	483
Foundry and machine-shop products.....	1909	11	179	15	22	142	193	252	24	80	114	280	166
	1904	9	190	10	18	162	.....	235	19	83	143	298	155
	1899	13	172	18	13	141	.....	113	12	60	82	222	149

1 Excluding statistics for one establishment, to avoid disclosure of individual operations.

2 Excluding statistics for two establishments, to avoid disclosure of individual operations.

3 Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

4 Figures can not be shown without disclosing individual operations.

MANUFACTURES - TENNESSEE.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY AND CITY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaries employed.	Wage earners (average number).							
Expressed in thousands.													
<b>NASHVILLE—Continued.</b>													
Furniture and refrigerators.....	1909	5	522	1	45	478	403	\$763	\$49	\$204	\$248	\$673	\$425
	1904	0	493	4	31	468		462	33	190	289	639	350
	1899												
Ice, manufactured.....	1909	4	170		23	153	1,795	354	27	66	67	233	160
	1904	3	63	1	9	53		129	9	25	33	120	87
	1899	4	97	4	14	70		195	11	33	28	112	84
Leather goods.....	1909	11	271	14	75	182	93	617	67	86	508	780	281
	1904	7	252	7	36	209		303	31	76	330	564	234
	1899	13			45	208		237	37	66	292	475	183
Lumber and timber products.....	1909	25	1,372	28	100	1,244	3,352	3,052	117	547	1,539	2,673	1,134
	1904	19	1,125	29	81	1,015		1,545	73	358	1,035	2,418	783
	1899	13	1,182	23	47	1,112		1,180	44	308	837	1,633	706
Mattresses and spring beds.....	1909	4	95	3	21	71	111	130	15	27	103	187	84
	1904	3	58	10	6	42		35	4	14	70	130	80
	1899	3	50	8	5	37		29	4	11	61	89	28
Patent medicines and compounds and druggists' preparations.....	1909	1-1	81	10	41	30	13	208	35	10	82	205	124
	1904	7	83	2	40	41		172	41	10	110	280	170
	1899	3	47	5	14	28		57	14	7	71	123	52
Printing and publishing.....	1909	80	1,875	61	579	1,235	1,227	3,594	603	728	896	3,285	2,389
	1904	54	1,426	41	340	1,045		2,543	344	552	591	2,292	1,701
	1899	52	1,066	44	291	731		2,115	240	371	421	1,628	1,207
All other industries.....	1909	130	4,275	132	639	3,504	8,788	15,755	658	1,318	6,021	11,716	4,795
	1904	92	2,641	89	298	2,254		7,481	322	713	3,444	6,274	2,830
	1899	94			313	3,396		6,325	281	1,029	3,080	5,758	2,672

CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES COMBINED.

Chattanooga.....	1909	185	7,507	125	972	6,410	17,509	\$16,125	\$1,180	\$2,816	\$8,434	\$16,036	\$7,602
	1904	177	7,236	130	686	6,420		10,394	719	2,564	7,474	14,201	6,787
	1899	140			468	4,729		7,459	417	1,016	6,421	10,518	4,097
Jackson.....	1909	42	1,613	28	180	1,405	2,789	2,236	193	673	1,215	2,710	1,495
	1904	42	1,421	35	118	1,208		1,519	112	498	1,183	2,318	1,135
	1899	33			101	1,018		980	78	400	698	1,577	884
Knoxville.....	1909	159	3,464	141	550	2,773	6,001	5,333	552	1,078	5,101	9,140	3,048
	1904	138	3,420	128	293	2,909		3,744	275	1,048	4,101	6,699	2,598
	1899	102			240	4,203		5,036	242	1,288	3,552	6,202	2,650

<sup>1</sup> Figures can not be shown without disclosing individual operations.

<sup>2</sup> Excluding statistics for two establishments, to avoid disclosure of individual operations.

<sup>3</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.

<sup>4</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

MANUFACTURES—TENNESSEE.

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Primary horse-power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners.					Total.	16 and over.		Under 16.		
					Male.	Female.	Average number.	Number.		Male.	Female.		Male.	Female.			
								Maximum month.	Minimum month.								
1 All industries.....	4,609	87,672	5,415	2,978	4,377	1,062	73,840	No 80,676	Ja 69,305	(1)	(1)	(1)	(1)	(1)	242,277		
2 Agricultural implements.....	10	712	9	26	22	10	645	De 743	My 567	761	745	4	12	.....	1,236		
3 Artificial stone.....	20	155	33	6	1	.....	115	Jy 155	Ja 57	142	140	2	.....	.....	51		
4 Bags, other than paper.....	5	404	5	13	33	8	405	No 492	My 345	436	151	242	22	21	576		
5 Belting and hose, leather.....	3	28	6	1	2	2	17	Je 19	Fe 15	17	17	.....	.....	.....	39		
6 Boots and shoes, including cut stock and findings.....	4	427	7	9	35	2	374	Jy 385	Fe 358	383	252	86	34	11	174		
7 Boxes, fancy and paper.....	6	227	3	11	7	4	202	No 222	Ja 184	238	90	144	.....	4	114		
8 Brass and bronze products.....	9	40	10	2	1	25	No 2	Ap 30	Ap 17	30	30	.....	.....	.....	43		
9 Bread and other bakery products.....	131	1,179	150	25	112	37	855	De 967	My 797	975	701	25-1	17	3	645		
10 Brick and tile.....	91	1,487	112	57	32	5	1,281	Jy 1,740	Fe 652	1,754	1,064	1	89	.....	4,631		
11 Brooms.....	29	173	40	8	2	1	122	No 148	My 102	152	120	25	5	2	82		
12 Buttons.....	5	76	6	1	.....	.....	69	No 128	Ja 24	123	119	4	.....	.....	84		
13 Canning and preserving.....	37	375	45	21	6	.....	303	Au 1,411	Mh 3	1,423	430	787	91	115	450		
14 Carriages and wagons and materials.....	129	1,992	150	82	38	16	1,706	No 1,833	Ja 1,555	1,892	1,875	4	13	.....	4,537		
15 Cars and general shop construction and repairs by steam-railroad construction and repairs by street-railroad companies.....	17	5,884	.....	81	231	6	5,566	De 6,081	My 5,197	6,007	6,051	15	1	.....	5,145		
16 Cars and general shop construction and repairs by street-railroad companies.....	6	283	.....	6	10	1	266	De 283	Fe 252	283	279	4	.....	.....	504		
17 Cars, steam-railroad, not including operations of railroad companies.....	3	1,170	.....	22	42	2	1,104	No 1,588	My 504	1,539	1,539	.....	.....	.....	1,400		
18 Clothing, men's, including shirts.....	34	1,892	34	66	176	20	1,596	Ja 1,775	Oc 1,460	1,772	341	1,401	.....	30	593		
19 Coffins, burial cases, and undertakers' goods.....	8	570	.....	24	59	7	480	Fe 487	No 472	480	448	32	.....	.....	976		
20 Coke.....	8	270	.....	9	11	.....	250	No 325	Jy 205	322	322	.....	.....	.....	370		
21 Confectionery.....	31	1,086	23	40	108	21	894	No 1,083	Ja 708	1,073	550	511	7	5	1,154		
22 Cooperage and wooden goods, not elsewhere specified.....	19	913	18	20	16	3	856	De 1,032	My 685	1,047	898	120	26	3	2,209		
23 Copper, tin, and sheet-iron products.....	57	704	73	21	31	7	572	Au 674	Fe 389	653	614	16	16	7	154		
24 Cotton goods, including cotton small wares.....	17	3,164	3	48	31	4	3,078	My 3,120	Se 3,042	3,123	1,389	1,183	277	274	11,129		
25 Electrical machinery, apparatus, and supplies.....	5	118	.....	12	2	5	99	De 119	Je 88	119	90	28	1	.....	94		
26 Fertilizers.....	12	670	12	23	71	5	559	Mh 893	Je 372	517	517	.....	.....	.....	2,152		
27 Flour-mill and gristmill products.....	454	2,658	663	166	226	26	1,577	Au 1,661	Je 1,425	1,650	1,633	2	13	2	27,176		
28 Foundry and machine-shop products.....	124	4,694	102	200	281	70	4,041	No 4,517	Ja 3,655	4,513	4,452	8	53	.....	7,458		
29 Furnishing goods, men's.....	4	57	2	5	3	1	46	De 49	Mh 40	49	49	5	42	2	.....		
30 Furniture and refrigerators.....	42	2,667	15	107	95	31	2,419	De 2,694	Ja 2,232	2,696	2,405	75	156	.....	3,758		
31 Gas, illuminating and heating.....	11	530	4	24	67	13	422	De 514	Fe 373	515	515	.....	.....	.....	633		
32 Hosiery and knit goods.....	22	3,220	2	60	28	22	3,117	Ap 3,191	Mh 3,038	3,261	841	1,878	209	333	2,758		
33 Ice, manufactured.....	57	986	46	96	55	9	770	Jy 1,143	Ja 440	749	742	.....	7	.....	9,327		
34 Iron and steel, blast furnaces.....	13	1,268	.....	48	69	8	1,143	Ja 1,461	My 893	1,539	1,526	.....	13	.....	18,150		
35 Jewelry.....	5	37	6	4	7	1	19	Ja 19	Jy 19	19	19	.....	.....	.....	27		
36 Leather goods.....	47	808	47	73	68	16	604	De 657	My 558	657	585	29	43	.....	344		
37 Leather, tanned, curried, and finished.....	25	463	26	19	19	4	395	Mh 429	Se 369	388	388	.....	.....	.....	1,684		
38 Lime.....	20	461	19	20	5	2	415	Se 451	Ja 353	454	.....	.....	3	.....	668		
39 Liqueurs, distilled.....	39	239	40	20	21	4	154	No 174	Jy 123	187	180	.....	.....	.....	1,205		
40 Liqueurs, malt.....	5	450	2	13	40	3	392	Jy 451	Fe 346	368	349	1	18	.....	3,005		
41 Lumber and timber products.....	1,977	26,283	2,633	623	504	84	22,380	No 25,462	Ja 20,620	28,003	28,032	182	373	16	83,382		
42 Marble and stone work.....	81	1,189	88	37	47	11	1,006	De 1,060	Ja 942	1,076	1,072	2	2	.....	2,781		
43 Mattresses and spring beds.....	17	352	20	30	19	11	272	No 329	Ap 219	325	257	65	3	.....	1,090		
44 Millinery and lace goods.....	6	154	8	12	21	21	92	Se 121	Je 54	71	9	62	.....	.....	4		
45 Models and patterns, not including paper patterns.....	0	24	8	2	.....	.....	12	De 16	Ap 11	16	16	.....	.....	.....	41		
46 Oil, cottonseed, and cake.....	20	957	4	53	89	5	808	No 1,394	Jy 180	1,407	1,405	2	.....	.....	7,472		
47 Paint and varnish.....	6	117	1	17	22	6	71	My 77	Ja 63	74	65	7	2	.....	1,045		
48 Patent medicines and compounds and druggists' preparations.....	76	998	52	85	276	152	433	De 520	Ja 399	532	220	309	2	1	418		
49 Photo-engraving.....	6	55	6	6	.....	3	40	No 46	Au 35	44	30	.....	5	.....	30		
50 Pottery, terra-cotta, and fire-clay products.....	6	354	3	6	21	1	323	Je 333	De 311	319	314	2	3	.....	678		
51 Printing and publishing.....	413	4,442	443	229	627	229	2,914	Se 3,011	Ja 2,799	3,043	2,339	614	88	2	2,965		
52 Saws.....	5	46	8	5	4	1	28	Jy 31	Mh 21	20	22	.....	.....	.....	106		
53 Slaughtering and meat packing.....	27	379	31	23	38	7	280	De 633	My 151	631	591	39	1	.....	1,242		
54 Stoves and furnaces, including gas and oil stoves.....	17	1,242	7	46	66	38	1,085	No 1,275	Ja 651	1,250	1,195	45	10	.....	1,380		
55 Surgical appliances and artificial limbs.....	3	7	3	.....	.....	.....	4	Ja 4	Jy 4	4	4	.....	.....	.....	3		
56 Woolen, worsted, and felt goods, and wool hats.....	21	1,737	21	27	30	5	1,654	Je 1,746	Ja 1,569	1,686	751	753	88	94	2,371		
57 All other industries.....	346	6,730	316	288	543	109	5,469	.....	.....	.....	.....	.....	.....	.....	22,017		

1 No figures given for reasons explained in the Introduction, page 2. See also discussion of wage earners on page 7.  
 2 Same number reported for one or more other months.  
 3 Same number reported for entire year.  
 4 All other industries embrace—

Automobiles, including bodies and parts.....	2	Clothing, women's.....	3	Fireworks.....	1
Awnings, tents, and sails.....	8	Coffee and spice, roasting and grinding.....	8	Flags, banners, regalia, society badges and emblems.....	1
Axle grease.....	1	Cordage and twine and jute and linen goods.....	1	Flavoring extracts.....	10
Babbitt metal and solder.....	2	Cordials and sirups.....	2	Food preparations.....	23
Baking powders and yeast.....	2	Cutlery and tools, not elsewhere specified.....	2	Gas and electric fixtures and lamps and reflectors.....	2
Blackening and cleaning and polishing preparations.....	3	Dyestuffs and extracts.....	6	Glass.....	1
Bluing.....	1	Electroplating.....	1	Glass, cutting, staining, and ornamenting.....	2
Carpets, rag.....	2	Engraving and dieinking.....	1	Grease and tallow.....	1
Cement.....	1	Explosives.....	2	Hair work.....	4
Charcoal.....	1	Fancy articles, not elsewhere specified.....	1	.....	.....

MANUFACTURES—TENNESSEE.

THE STATE, BY INDUSTRIES: 1909.

	Capital.	EXPENSES.										Value of products.	Value added by manufacture.	
		Total.	Services.			Materials.			Miscellaneous.					
			Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.			
1	\$167,923,784	\$168,979,837	\$4,070,223	\$4,516,020	\$28,251,501	\$5,191,450	\$98,824,384	\$566,378	\$3,202,601	\$1,814,508	\$11,042,592	\$180,216,548	\$76,200,714	
2	1,465,895	838,978	41,213	38,975	268,119	20,018	383,872	.....	11,440	340	66,001	1,003,747	590,857	
3	84,353	109,045	5,600	5,600	38,117	564	57,354	568	433	.....	7,159	140,715	88,797	
4	1,401,135	2,343,811	27,900	39,500	130,171	13,009	2,006,884	2,000	5,394	.....	57,543	2,290,992	210,430	
5	52,488	68,055	1,500	4,031	9,903	630	49,480	810	237	.....	1,458	75,986	25,870	
6	532,067	1,120,904	23,800	46,117	117,806	6,761	820,730	2,763	1,814	30,316	70,761	1,180,891	353,397	
7	148,284	230,355	18,008	9,424	57,883	2,576	119,552	6,650	506	.....	21,750	257,501	135,373	
8	69,933	67,113	2,040	1,080	18,619	2,697	33,632	700	254	1,200	5,595	82,372	40,043	
9	1,250,877	2,519,781	46,677	85,782	375,826	45,009	1,743,983	40,034	8,507	150	163,243	2,891,821	1,102,219	
10	1,807,654	1,051,018	53,892	28,435	443,259	237,908	108,521	14,524	0,272	40,715	110,202	1,307,826	962,207	
11	96,169	224,006	7,775	1,787	42,829	1,778	150,934	4,557	.....	.....	8,132	270,297	111,585	
12	35,300	46,423	360	.....	28,703	1,173	13,739	750	30	1,020	588	48,895	33,923	
13	274,622	100,526	8,995	1,848	39,276	2,671	127,982	661	959	550	7,554	209,098	75,415	
14	3,005,864	2,541,308	114,080	44,563	693,307	22,549	1,410,877	22,021	15,893	40,313	170,805	3,039,613	1,600,187	
15	4,034,678	6,776,511	132,648	196,000	3,251,658	103,680	3,011,853	.....	10,911	1	63,260	6,776,511	3,600,978	
16	348,343	305,067	9,870	7,340	150,372	2,630	127,061	.....	6,485	.....	1,300	305,067	176,276	
17	1,478,026	1,752,539	44,682	41,825	635,321	15,435	902,006	.....	5,148	.....	48,172	1,000,208	931,827	
18	2,256,777	3,104,956	100,249	208,755	492,051	12,872	2,109,638	26,803	8,144	48,333	188,311	3,361,105	1,238,605	
19	1,138,445	1,085,549	47,420	82,980	200,948	7,203	515,245	.....	6,382	.....	225,371	1,188,693	600,245	
20	857,614	597,122	9,803	4,504	80,784	468,900	8,540	.....	3,558	.....	14,913	585,085	108,185	
21	1,503,918	2,286,598	64,024	112,289	276,271	24,153	1,633,036	33,414	8,894	425	133,102	2,520,070	862,881	
22	1,442,637	1,081,355	33,395	16,598	253,131	2,157	620,426	1,025	4,268	100	144,255	1,148,260	519,686	
23	672,887	1,063,243	48,094	21,867	260,586	16,826	576,624	15,560	4,331	100	119,246	1,229,155	635,705	
24	7,453,807	4,810,321	81,409	23,957	859,837	103,111	3,240,561	.....	32,270	444	477,732	5,290,791	1,867,119	
25	117,598	131,814	23,038	3,500	32,764	2,040	40,788	840	548	.....	19,206	174,300	122,478	
26	4,105,633	2,847,758	49,532	87,167	203,750	32,620	2,089,099	1,550	18,864	.....	365,177	3,249,343	1,127,615	
27	8,510,635	27,190,073	176,865	145,712	559,242	108,648	25,087,218	15,912	48,224	2,394	955,858	29,070,019	3,784,153	
28	9,252,940	8,049,889	382,104	313,030	2,006,383	244,753	4,315,447	22,441	49,349	40,380	666,093	9,189,791	4,629,691	
29	73,720	113,660	7,000	1,812	14,232	528	72,700	800	507	.....	10,021	109,310	36,091	
30	3,496,853	2,996,798	151,070	106,566	896,882	27,367	1,420,506	12,713	18,958	85,600	270,530	3,300,385	1,801,512	
31	9,309,945	809,700	45,079	52,503	163,958	235,839	120,836	450	85,535	.....	105,600	1,281,558	924,883	
32	3,054,790	3,265,867	83,171	41,530	723,756	42,916	2,077,309	4,740	8,893	46,021	236,721	3,505,436	1,445,211	
33	2,747,094	1,028,451	109,988	43,527	362,167	180,814	91,224	235	28,293	.....	203,293	1,324,400	1,013,362	
34	7,122,172	4,186,377	107,846	30,115	519,274	1,802,704	1,577,962	.....	22,922	310	116,244	4,663,125	1,272,450	
35	51,122	75,319	4,700	5,200	14,027	1,101	40,993	5,086	637	.....	3,575	84,232	42,138	
36	1,419,188	1,841,775	84,342	66,274	243,386	12,835	1,299,785	19,581	5,588	18,143	101,841	2,138,798	826,178	
37	3,564,005	2,263,750	24,900	24,694	138,588	14,201	1,979,513	690	9,108	.....	72,146	2,529,901	530,187	
38	281,010	282,755	24,123	5,460	120,281	45,812	47,631	1,080	3,887	71	20,571	323,307	229,864	
39	1,398,202	1,877,346	31,912	11,935	53,400	26,062	368,658	1,145	1,350,357	.....	24,877	2,256,429	1,891,700	
40	2,263,430	1,728,428	53,050	68,621	238,460	51,513	601,730	.....	265,030	500	449,524	2,043,723	1,300,480	
41	30,158,572	24,892,523	848,872	476,445	6,965,997	100,419	13,541,622	38,664	114,292	1,085,650	1,721,162	30,450,807	16,815,306	
42	1,475,940	1,200,090	54,155	33,965	514,812	34,250	440,070	9,408	5,984	7,601	94,436	1,465,246	984,017	
43	512,761	564,616	31,090	21,119	103,960	9,072	353,307	7,401	2,013	.....	36,054	655,747	293,368	
44	56,350	167,008	9,820	10,477	26,155	1,147	99,989	5,796	809	.....	12,875	201,058	100,822	
45	12,124	15,771	1,700	173	8,933	148	2,938	911	32	.....	870	21,248	18,162	
46	3,730,736	6,021,621	117,496	84,257	290,266	95,825	5,105,240	.....	24,820	.....	369,708	6,592,776	1,301,702	
47	407,679	365,069	25,510	26,069	37,314	5,017	232,064	3,000	2,041	.....	39,263	390,712	158,731	
48	2,224,909	3,051,926	154,813	380,603	147,885	7,800	1,332,946	30,731	12,251	3,088	981,689	3,514,670	2,173,870	
49	30,535	57,569	9,226	1,501	23,569	1,631	7,021	2,695	91	2,390	9,235	68,734	60,082	
50	356,887	201,059	14,280	17,680	126,338	67,080	41,850	.....	2,772	.....	20,459	327,610	218,080	
51	6,493,325	5,970,963	393,303	692,192	1,701,128	78,598	1,874,987	105,383	35,717	271,812	817,844	7,173,230	5,219,645	
52	46,749	51,821	3,730	2,004	15,594	1,701	23,078	520	448	120	4,506	63,599	38,820	
53	2,516,295	1,895,094	31,270	29,736	140,275	33,110	1,577,000	2,904	8,801	1,750	70,248	2,666,719	446,009	
54	1,827,376	1,649,262	81,743	63,880	519,049	27,292	689,916	4,218	27,339	58,163	177,662	1,960,543	1,233,335	
55	18,825	5,684	.....	.....	2,600	152	1,765	360	70	.....	737	9,300	7,383	
56	2,515,275	1,745,036	55,842	16,764	419,233	29,476	1,097,257	450	10,060	.....	115,954	1,862,311	675,578	
57	27,163,544	18,116,121	552,010	632,822	2,261,327	645,580	11,245,975	82,929	882,397	10,773	1,801,308	21,127,989	9,236,434	

4 All other industries embrace—Continued.

Hand stamps and stencils and brands.....	8	Rubber goods, not elsewhere specified.....	1	Sulphuric, nitric, and mixed acids.....	1
Hats and caps, other than felt, straw, and wool...	1	Rules, ivory and wood.....	1	Tobacco manufactures.....	63
House-furnishing goods, not elsewhere specified....	1	Scales and balances.....	1	Toys and games.....	1
Iron and steel, steel works and rolling mills.....	1	Shipbuilding, including boat building.....	3	Type founding and printing materials.....	2
Iron and steel, doors and shutters.....	1	Shoddy.....	1	Upholstering materials.....	6
Mineral and soda waters.....	83	Show cases.....	2	Vinegar and cider.....	1
Mirrors.....	2	Signs and advertising novelties.....	1	Wall plaster.....	2
Musical instruments, pianos and organs, and mate- rials.....	2	Smelting and refining, copper.....	2	Wheelbarrows.....	1
Oil, not elsewhere specified.....	1	Soap.....	5	Window shades and fixtures.....	3
Optical goods.....	1	Sporting and athletic goods.....	1	Wirework, including wire rope and cable.....	4
Paving materials.....	2	Stationary goods, not elsewhere specified.....	2	Wood, turned and carved.....	42
		Stereotyping and electrotyping.....	2		

## MANUFACTURES: TEXAS

## STATISTICS OF MANUFACTURES FOR THE STATE, CITIES, AND INDUSTRIES

Prepared under the supervision of W. M. STEUART, Chief Statistician for Manufactures

## INTRODUCTION.

This advance bulletin gives the statistics of manufactures for the state of Texas for the calendar year 1909 as shown by the Thirteenth Census. It will be reprinted without change as a part of the Compendium of the Census for Texas, and in the final reports of the Thirteenth Census.

The text summarizes the general results of the census inquiry, presenting a series of special tables in which the main facts printed in the general tables are given in convenient form for the state as a whole and for important industries. It also presents tables in which the statistics for the industries of the state as a whole and for a few important industries are classified by character of ownership, size of establishments, number of wage earners, and prevailing hours of labor, information which could not be presented in general tables for each industry without disclosing the facts for individual establishments.

At the end of the bulletin are two general tables.

Table I gives for 1909, 1904, and 1899 the number of establishments and of persons engaged in the industries, primary power, capital, salaries and wages, cost of materials, value of products, and value added by manufacture reported for all industries combined and for certain important industries (1) for the state as a whole and (2) for the cities of San Antonio, Dallas, Houston, and Fort Worth. It also gives the same items for all industries combined for every city and town having in 1910 a population of over 10,000 but less than 50,000.

Table II gives statistics in detail for 1909 for the state and for a larger number of industries.

**Scope of census: Factory industries.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of organization, location of establishments, size of establishments, labor force, and similar subjects. When use is made of the data for these purposes, it is imperative that due attention should be given to the limitations of the figures. Particularly is this true when the attempt is made to derive from them figures purporting to show average wages, cost of production, or profits. These limitations will be fully discussed in the general report on manufactures for the United States as a whole. It is impossible to reproduce such discussion in the bulletins relative to the individual states.

The census of 1909, like that of 1904, was confined to manufacturing establishments conducted under the factory system, as dis-

tinguished from the neighborhood, hand, and building industries. Where statistics for 1899 are given they have been reduced to a comparable basis by eliminating the latter classes of industries. The census does not include establishments which were idle during the entire year, or had a value of products of less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions, or in governmental establishments, except those of the Federal Government.

**Period covered.**—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—The term "establishment" comprises the factories, mills, or plants which are under a common ownership or control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment as thus defined were not all located within the same city or state, separate reports were secured in order that the separate totals might be included in the statistics for each city or state. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products very different from those covered by the class designation, and, on the other hand, may not include the total product covered by this designation, because some part of this product may be made in establishments in which it is not the product of chief value.

**Selected industries.**—The general tables at the end of this bulletin give the principal facts separately for the industries of the state. A selection has been made of the leading industries of the state for more detailed consideration. Sometimes an industry of greater importance than some of those selected is omitted because it comprises so few establishments that these detailed presentations would reveal the operations of individual concerns.

**Comparisons with previous censuses.**—Owing to the changes in industrial conditions it is not always possible to classify establishments by industries in such a way as to permit accurate comparison with preceding censuses. Table I, giving comparable figures for 1909, 1904, and 1899, therefore, does not embrace all the industries shown for 1909 in Table II.

**Influence of increased prices.**—In considering changes in cost of materials, value of products, and value added by manufacture, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures can not be taken as an exact measure of increase in the volume of business.

**Persons engaged in industry.**—At the censuses of 1909, 1904, and 1899 the following general classes of persons engaged in manufacturing industries have been distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks, and (5) wage earners. In the censuses of 1904 and 1899 these five classes were shown according to the three

main groups: (1) Proprietors and firm members, (2) salaried officials, clerks, etc., and (3) wage earners. The second group included the three classes of salaried officers of corporations, superintendents and managers, and clerks. In the present census an entirely different grouping is employed: That into (1) proprietors and officials, (2) clerks, and (3) wage earners. The first group includes proprietors and firm members, salaried officers of corporations, and superintendents and managers.

At this census the number of persons engaged in the industries, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for December 15, or the nearest representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where conditions were exceptional, and particularly in the case of certain seasonal industries, such as canning, the December date could not be accepted as typical, and an earlier date had to be chosen.

In the case of employees other than wage earners the number thus reported on December 15, or other representative day, has been treated as equivalent to the average for the year, since the number of employees of this class does not vary much from month to month in a given industry. In the case of wage earners the average is obtained in the manner explained in the next paragraph.

**Wage earners.**—In addition to the report by sex and age of the number of wage earners on December 15, or other representative day, a report was obtained of the number employed on the 15th of each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because in view of the variations of date such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In particular, totals by sex and age for the wage earners reported for the representative day would be misleading because of the undue weight given to seasonal industries, in some of which, such as canning and preserving, the distribution of the wage earners by sex and age is materially different from that in most industries of more regular operation. In order to determine as nearly as possible the sex and age distribution of the average number of wage earners in the state as a whole, the following procedure has been adopted:

The percentage distribution by sex and age of the wage earners in each industry, for December 15, or the nearest representative day, has been calculated from the actual numbers reported for that date. This percentage has been applied to the average number of wage earners for the year in that industry, to determine the average number of men, women, and children employed. These calculated averages for the several industries have been added up to give the average distribution for the state as a whole.

In 1899 and 1904 the schedule called for the average number of wage earners of each sex 16 years and over, and the total number under 16 years of age, for each month, and these monthly statements were combined in an annual average. Comparatively few manufacturing concerns, however, keep their books in such way as to show readily the number of men, women, and children (under 16) employed each month. These monthly returns by sex and age were, in fact, largely estimates. It was believed that a more accurate and reliable sex and age distribution could be secured by taking as a basis of estimate the actual numbers employed on a single day.

**Prevailing hours of labor.**—The census made no attempt to ascertain the number of employees working a given number of hours per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and no attention is given to the fact that a limited number of employees may have hours differing from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

**Capital.**—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

**Materials.**—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term materials includes fuel, rent of power and heat, mill supplies, and containers, as well as materials forming a constituent part of the product. Fuel includes all fuel used, whether for heat, light, or power, or for the process of manufacture.

**Expenses.**—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness, and allowances for depreciation.

**Value of products.**—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

**Value added by manufacture.**—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishments. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "value added by manufacture."

**Cost of manufacture and profits.**—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products, the rate of profit on the investment could not properly be calculated, because of the very defective character of the returns regarding capital.

**Primary power.**—The figures given for this item show the total of the primary power used by the establishments. They do not cover

the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

**Location of establishments.**—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the fact that often establishments are located just outside the boundaries of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

### INDUSTRIES IN GENERAL.

**General character of the state.**—Texas, with a gross area of 265,896 square miles, of which 3,498 represent water surface, is the largest state in the Union. Its population in 1910 was 3,896,542, as compared with 3,048,710 in 1900 and 2,235,527 in 1890. It ranked fifth among the 49 states and territories of continental United States as regards population in 1910 and sixth in 1900. The density of population for the entire state was 14.8 per square mile, the corresponding figure for 1900 being 11.6. Twenty-four and one-tenth per cent of the entire population of the state resided in incorporated cities and towns having a population of 2,500 inhabitants or over, as against 17.1 per cent in 1900.

San Antonio, with a population of 96,614; Dallas, with 92,104; Houston, with 78,800; and Fort Worth, with 73,312, were the only cities in the state which had a population in 1910 of over 50,000. There were, however, 16 cities which had a population of over 10,000 but less than 50,000. These cities, in order of their importance in population, were as follows: El Paso, Galveston, Austin, Waco, Beaumont, Laredo, Denison, Sherman, Marshall, Paris, Temple, Brownsville, Palestine, Tyler, Cleburne, and San Angelo. Apart from these cities, only 8.2 per cent of the population in 1910 resided in places of 2,500 inhabitants or over.

The transportation facilities are exceptionally good. The state is traversed by several important railway systems and, with 13,521<sup>1</sup> miles in 1909, had more steam railway trackage than any other state in the Union. Although only navigable for light-draft vessels, there are a number of streams which afford water communication for a considerable area of the eastern part of the state. Galveston, an important commercial center in the state, is one of the largest ports of entry in the South. Sabine is also a port of growing prominence. These avenues of transportation afford excellent opportunities for interstate, domestic coastwise, and foreign commerce.

**Importance and growth of manufactures.**—The manufactures of Texas depend largely for their raw materials upon the stock-raising, agricultural, and mineral products of the state and have been greatly stimulated by the rapid increase in the production of these materials. Between 1849-50 and 1889-90 there was a steady growth in manufactures, but the total value of

**Laundries.**—The census of 1909 was the first to include statistics of laundries. The reports are confined to establishments using mechanical power. The data are presented separately and are not included in the general total for manufacturing industries, in order to avoid interference with comparisons with prior censuses.

**Custom gristmills.**—In order to make the statistics for 1909 comparable with those for 1904 the data for these mills have been excluded from all the tables presenting general statistics, and are given in a separate table at the end of this report.

the manufactures of the state, including the products of the neighborhood and hand industries, amounted to only \$70,434,000 in the latter year, while in 1909, exclusive of the value of the products of the neighborhood and hand industries, it had reached \$272,896,000, representing an increase of nearly 300 per cent during the 20 years. The population of the state during the same period increased only 74.3 per cent. The gross value of products per capita of the total population of the state increased from \$32 in 1889 to \$70 in 1909. The number of wage earners has not increased as rapidly as the value of manufactured products. It has, however, almost exactly kept pace with the growth in population, for the 34,794 wage earners reported in 1889 and the 70,230 reported in 1909 represent 1.6 per cent and 1.8 per cent of the total population of the state at the respective censuses. The proportion which the manufactures of the state represented of the total value of the products of manufacturing industries in the United States increased from eight-tenths of 1 per cent in 1889 to 1.3 per cent in 1909. Texas ranked twenty-fourth in 1889-90 among the states in respect to gross value of products, but advanced to seventeenth place in 1909.

The first table on the following page gives the most important figures relative to all classes of manufactures combined for 1909, 1904, and 1899, together with the percentages of increase from census to census.

In 1909 the state of Texas had 4,588 manufacturing establishments, which gave employment to an average of 84,575 persons during the year and paid out \$48,775,000 in salaries and wages. Of the persons employed, 70,230 were wage earners. These establishments turned out products to the value of \$272,896,000, to produce which materials costing \$178,179,000 were used. The value added by manufacture was thus \$94,717,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year.

In general, this table brings out the fact that while the growth of the manufacturing industries of Texas, as a whole, during the five-year period 1899-1904 was noteworthy, the growth during the more recent five-year period, 1904-1909, was even more pronounced. During the later period the number of establishments increased 45.3 per cent and the average number of wage earners 43.1 per cent, while the value of products increased 81.3 per cent and the value added by manufacture 60.7 per cent.

<sup>1</sup> Report of Interstate Commerce Commission, 1909.

operations. The industry has had a remarkable growth in the state during the past 10 years, and in 1909 Texas was the fourth state in the Union in the production of refined petroleum.

In addition to the industries presented separately in the above table and petroleum refining, there are six important industries each of which had a value of products in 1909 exceeding \$1,000,000. They are included under the head of "All other industries" in the table because in some cases the operations of individual establishments would be disclosed if they were shown separately; in others because the returns do not properly present the true condition of the industry, as it is more or less interwoven with one or more industries; and in still others because comparable statistics for the different census years can not be presented on account of changes in classification or the data for prior censuses are not available. These industries are as follows: Bags, other than paper; coffee and spice, roasting and grinding; mineral and soda waters; smelting and refining, copper; smelting and refining, lead; and wood preserving. For similar reasons, 30 less important industries which had a value of products in 1909 in excess of \$100,000 but less than \$1,000,000 are also included under "All other industries."

The most important industries listed in the preceding table, in which they are arranged in the order of the value of products, call for brief consideration.

*Slaughtering and meat packing.*—This classification includes the wholesale slaughtering and meat-packing establishments and those engaged in the manufacture of sausage only. Although stock raising has always been an exceedingly important industry in the state, only during the last decade has slaughtering and meat packing assumed large proportions. From a comparatively small industry in 1899, it had become the leading industry of the state in 1909 as measured by value of products.

*Flour-mill and gristmill products.*—All mills which grind wheat, rye, or buckwheat flour, or corn meal, hominy, grits, or feed are included in this industry. Factories making fancy cereals or other food preparations as a chief product are not included. Furthermore, the statistics for mills grinding exclusively for toll, usually small and operated for local consumption, are not included in this classification or in the general statistics for the state, but are shown separately on page 18.

*Lumber and timber products.*—This industry includes logging operations, the sawmills, shingle mills, planing mills, and wooden packing-box factories. From the standpoint of the number of wage earners, this is the most important industry in the state, the average number of wage earners reported for 1909 constituting 33.5 per cent of the total employed in all manufactures in the state.

*Oil, cottonseed, and cake.*—The statistics include those for all establishments engaged primarily in

extracting oil from cotton seed or refining crude cottonseed oil. Prior to 1870 cotton seed was considered practically worthless, except for planting, and it was not until after 1880 that it came to be extensively utilized in the United States. Texas, the leading cotton-producing state, has naturally become also the leading state in the manufacture of cottonseed products, which position it has held since 1889. In 1909 it contributed 20.2 per cent of the total value of cottonseed products reported for the United States. The percentage of increase in value added by manufacture from 1904 to 1909 was much greater than the percentage of increase in value of products, although both increases were large.

*Cars and general shop construction and repairs by steam-railroad companies.*—This industry represents the work done in the car shops of steam-railroad companies, and is practically confined to repairs of the rolling stock and equipment of their own roads, although to a limited extent there may be some new construction of rolling stock. The statistics are exclusive of minor repairs in roundhouses. Judged by the number of wage earners employed, this was the second industry in the state in 1909.

*Printing and publishing.*—All establishments primarily engaged in printing and publishing newspapers, books, periodicals, and music, job printing, bookbinding and blank-book making, lithographing, and engraving are included under this head. More establishments were reported for this industry in 1909 than for any other manufacturing industry in the state.

*Rice, cleaning and polishing.*—This is a comparatively new industry in the state and its growth has been remarkable. The first establishment was reported for the state in 1899, but in 1904, 17 establishments were in operation and the products were valued at \$4,640,000. With an increase during the next five years of 75.5 per cent in value of products, Texas became the second state in the Union in this industry.

Measured by value added by manufacture, all but one of these seven industries hold a somewhat different rank from that which they hold when measured by value of products. On account of the comparatively simple processes involved in slaughtering and meat packing, in the flour-mill and gristmill industry, and in cleaning and polishing rice, and the extent to which the work is carried on by machinery in the last two industries, the value added by manufacture is not commensurate with the value of products. For these reasons the slaughtering and meat-packing industry which stands first in value of products becomes fifth in importance on the basis of value added by manufacture, and the flour-mill and gristmill industry drops from second to eighth place, and the cleaning and polishing of rice from seventh to sixteenth place, while the lumber industry would stand first, printing and publishing second, steam-railroad repair shops third, and the cottonseed-oil industry fourth. Similar changes would occur in the relative standing of many of the other industries.

## MANUFACTURES—TEXAS.

The table on page 4 shows also the percentages of increase for these leading industries in respect to value of products and value added by manufacture where the figures are comparable. For the five-year period, 1904-1909, the manufacture of food preparations shows a greater rate of increase in value of products, and that of butter, cheese, and condensed milk a greater relative gain in value added by manufacture, than any of the other specified industries, namely, 1,294.4 per cent and 828.6 per cent, respectively. The remarkable increase in the former industry was due in a large measure to the increased production of establishments manufacturing lard compound, and of those making macaroni, and in the latter industry almost entirely to the decided gain of those which manufacture butter. The furniture and refrigerator and the slaughtering and meat-packing industries also show remarkable increases in both items. As the latter is the leading industry in the state, the percentages of increase, although not so great as those shown for most of the other three industries mentioned above, are the most significant. There are some striking differences among the several industries specified as respects the relative increase for the two five-year periods covered by the table. Of the first 20 industries presented separately, however, all show an increase for each period in value of products, and all but two an increase in value added by manufacture.

**Persons engaged in manufacturing industries.**—The following table shows for 1909 the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables is an estimate obtained by the method described in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes.....	84,575	70,096	4,879
Proprietors and officials.....	7,911	7,763	148
Proprietors and firm members.....	4,496	4,373	123
Salaried officers of corporations.....	940	920	11
Superintendents and managers.....	2,475	2,461	14
Clerks.....	6,434	5,808	626
Wage earners (average number).....	70,230	66,125	4,105
16 years of age and over.....	68,074	65,092	3,882
Under 16 years of age.....	1,256	1,033	223

The average number of persons engaged in manufactures during 1909 was 84,575, of whom 70,230 were wage earners. Of the remainder, 7,911 were proprietors and officials and 6,434 were clerks. Corresponding figures for individual industries will be found in Table II, page 24.

The next table shows for 1909 the percentage of proprietors and officials, clerks, and wage earners, respectively, among the total number of persons employed in manufactures. It covers all industries combined and 15 important industries individually.

INDUSTRY.	PERSONS ENGAGED IN MANUFACTURES.			
	Total number.	Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
All industries.....	84,575	9.4	7.6	83.0
Bread and other bakery products.....	2,078	22.8	10.3	60.9
Brick and tile.....	2,135	6.8	2.5	90.6
Cars and general shop construction and repairs by steam-railroad companies.....	10,527	2.6	4.4	92.9
Cotton goods, including cotton small wares.....	1,633	1.5	1.2	97.4
Flour-mill and gristmill products.....	1,890	19.9	16.1	64.0
Food preparations.....	367	10.6	12.0	77.4
Foundry and machine-shop products.....	3,441	8.3	6.7	85.0
Ice, manufactured.....	1,874	15.0	8.3	76.7
Leather goods.....	1,012	12.4	16.4	71.2
Liquors, malt.....	931	5.8	12.0	82.2
Lumber and timber products.....	25,843	6.1	2.0	91.0
Oil, cottonseed, and cake.....	3,923	12.6	0.0	78.3
Printing and publishing.....	7,177	22.1	16.5	61.4
Rice, cleaning and polishing.....	643	11.4	21.8	66.0
Slaughtering and meat packing.....	4,248	1.0	13.3	85.7
All other industries.....	16,844	12.2	9.0	77.0

Of the total number of persons engaged in all manufacturing industries, 9.4 per cent were proprietors and officials, 7.6 per cent clerks, and 83 per cent wage earners. In the bakery, the printing and publishing, and the flour-mill and gristmill industries, the majority of the establishments are small and the work is to a large extent done by the proprietors or their immediate representatives, so that the proportion of persons engaged in these industries falling into the class of proprietors and officials is, therefore, much greater than for most other industries or for all industries combined. Similar conditions prevail, but to a less degree, in the manufactured-ice and the leather-goods industries, and also in the manufacture of cottonseed products, although in the latter industry the establishments are somewhat larger. The smallest proportions for this class are shown for the slaughtering and meat-packing and the cotton-goods industries, on account of the large average number of wage earners to an individual establishment, and because all of the establishments in the latter and all but two in the former industry are under corporate ownership.

The following table shows, for 1909, in percentages for all industries combined the distribution of the average number of wage earners by age periods, and for those 16 years of age and over by sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries separately, a similar distribution of wage earners as reported for December 15, or the nearest representative day. As a means of judging the importance of the several industries the average number employed for the year is also given in each case.

INDUSTRY.	WAGE EARNERS.			
	Average number. <sup>1</sup>	Per cent of total.		
		16 years of age and over.		Under 16 years of age.
Male.	Female.			
<b>All industries.....</b>	<b>70,230</b>	<b>92.7</b>	<b>5.5</b>	<b>1.8</b>
Bread and other bakery products.....	1,391	71.2	25.7	3.0
Brick and tile.....	1,935	97.6	.....	2.4
Cars and general shop construction and repairs by steam-railroad companies.....	9,782	99.9	( <sup>2</sup> )	( <sup>2</sup> )
Cotton goods, including cotton small wares.....	1,590	53.1	32.7	14.2
Flour-mill and gristmill products.....	1,216	99.3	0.2	0.4
Food preparations.....	284	71.1	28.2	0.7
Foundry and machine-shop products.....	2,925	99.2	0.1	0.8
Ice, manufactured.....	1,437	99.4	0.1	0.5
Leather goods.....	721	97.1	1.7	1.2
Liquors, malt.....	765	99.9	0.1	.....
Lumber and timber products.....	23,518	98.5	0.2	1.3
Oil, cottonseed, and cake.....	3,073	99.9	0.1	.....
Printing and publishing.....	4,408	80.3	13.9	5.8
Rice, cleaning and polishing.....	430	100.0	.....	.....
Slaughtering and meat packing.....	3,639	91.7	6.4	1.9
All other industries.....	13,116	82.6	15.4	2.0

<sup>1</sup> For method of estimating the distribution by sex and age periods, of the average number in all industries combined, see Introduction.  
<sup>2</sup> Less than one-tenth of 1 per cent.

For all industries combined, 92.7 per cent of the average number of wage earners were males 16 years of age and over; 5.5 per cent females 16 years of age and over; and 1.8 per cent children under 16 years of age. The relatively small proportion of women and children employed in Texas is of interest. Of the industries shown in this table, the cotton mills, the factories engaged in the manufacture of food preparations, the bakeries, and printing and publishing establishments report the largest proportions of female wage earners. In the cotton-goods industry nearly one-third of the employees were women 16 years of age and over; in the manufacture of food preparations nearly three-fourths; in the bakeries about one-fourth; and in printing and publishing establishments nearly one-seventh. The largest actual number of female wage earners 16 years of age and over were employed in the men's clothing industry, which is included under the head of "All other industries." In this industry women formed nearly nine-tenths of the total number of wage earners. The confectionery establishments also employed a large number of female wage earners.

The largest proportions of wage earners under 16 years of age are shown for the cotton-goods and the printing and publishing industries. Although a greater actual number of wage earners under 16 years of age was reported for the lumber industry than for any other in the state, the number of wage earners of all classes shown for that industry is so large that this particular class of employees forms but a small proportion of the total shown for the industry.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904, it is necessary to use the classification employed at the earlier census. (See Intro-

tion.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				
	1909		1904		Per cent of increase, 1904-1909.
	Number.	Per cent distribution.	Number.	Per cent distribution.	
<b>Total.....</b>	<b>84,575</b>	<b>100.0</b>	<b>57,892</b>	<b>100.0</b>	<b>46.1</b>
Proprietors and firm members.....	4,496	5.3	3,073	5.3	40.3
Salaried employees.....	9,849	11.6	5,753	9.9	71.2
Wage earners (average number)....	70,230	83.0	49,066	84.8	43.1

Comparable figures are not obtainable for 1899. The table shows the greatest percentage of increase to have been in the salaried employees, which is the only class forming a larger proportion of the total in 1909 than in 1904.

The next table shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over according to sex, for 1909, 1904, and 1899. The averages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Percent distribution.	Number.	Percent distribution.	Number.	Percent distribution.
<b>Total.....</b>	<b>70,230</b>	<b>100.0</b>	<b>49,066</b>	<b>100.0</b>	<b>38,604</b>	<b>100.0</b>
16 years of age and over..	68,974	98.2	48,245	98.3	37,688	97.6
Male.....	65,092	92.7	45,766	93.3	35,905	93.2
Female.....	3,882	5.5	2,479	5.1	1,693	4.4
Under 16 years of age....	1,256	1.8	821	1.7	616	2.4

This table indicates that for all industries combined there has not been much change in the proportion of male and female wage earners. The proportion of children under 16 years of age was smaller in 1909 than in 1899, although slightly larger than in 1904. In 1909 males 16 years of age and over formed 92.7 per cent of all wage earners, as compared with 93.3 per cent in 1904 and 93.2 per cent in 1899.

**Wage earners employed by months.**—The following table gives the number of wage earners employed on the 15th of each month during the year 1909 for all industries combined, for the cottonseed-oil industry, and for all other industries combined. It gives also the percentage which the number reported for each month is of the greatest number reported for any month. In Table II, page 24, are shown for practically all of the important industries in the state the largest number and the smallest number of wage earners reported for any month. The figures are for the 15th day, or the nearest representative day, of the month.

MANUFACTURES—TEXAS.

MONTH.	NUMBER OF WAGE EARNERS.					
	All industries.		Oil, cottonseed, and cake.		All other industries.	
	Number.	Percent of maximum.	Number.	Percent of maximum.	Number.	Percent of maximum.
January	68,563	90.6	4,331	75.2	64,232	91.9
February	66,485	87.9	3,534	61.3	62,951	90.1
March	68,082	90.0	2,195	38.1	65,887	94.3
April	67,772	89.6	1,396	24.2	66,376	95.0
May	66,079	87.4	1,087	18.9	64,992	93.0
June	68,037	89.0	932	16.2	67,105	95.0
July	69,153	91.4	967	16.8	68,186	97.6
August	69,192	91.5	1,422	24.7	67,770	97.0
September	73,196	96.8	4,067	71.1	69,099	98.9
October	76,291	99.5	5,718	99.2	69,573	96.6
November	76,648	100.0	5,762	100.0	69,886	100.0
December	75,258	99.5	5,430	94.2	69,828	99.9

In addition to that shown for the cottonseed-oil industry, there was a considerable variation in the number of wage earners employed from month to month in the sugar and molasses industry, but the numbers of wage earners reported for the industry were too small to affect materially the totals for the state. In the cottonseed-oil industry the period of greatest employment of wage earners follows closely

upon the maturity of the cotton crop. The smallest number, 932, were employed in June, from which time the number increased constantly to November, when 5,762 were employed, or 4,830 more than in June. The table indicates that, for all industries combined, the month of minimum employment was May and the month of maximum employment November. With the cottonseed-oil industry excluded, November remains the month of greatest activity, but February takes the place of May as the month of least activity, and the employment throughout the year becomes much steadier, the month of least employment showing a difference of only 6,935, or 9.9 per cent, from the month of greatest employment.

**Prevailing hours of labor.**—In the following table wage earners have been classified according to the hours of labor prevailing in the establishments in which they are employed. In making this classification the average number of wage earners employed during the year is used, and the number employed in each establishment is classified as a total according to the hours prevailing in that establishment, even though a few employees work a greater or less number of hours.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries	70,230	6,575	1,856	12,945	2,981	30,583	8,318	4,188	2,784
Bread and other bakery products	1,301	00	6	125	11	882	201	56	50
Brick and tile	1,035	20	30	222	43	1,488	128	4	3
Butter, cheese, and condensed milk	84	5	.....	.....	.....	10	57	.....	.....
Canning and preserving	158	.....	.....	.....	20	114	.....	24	.....
Carriages and wagons and materials	412	39	12	187	51	100	.....	.....	13
Cars and general shop construction and repairs by steam-railroad companies	9,782	1,000	153	5,092	727	1,727	1,067	.....	7
Clothing, men's, including shirts	902	521	155	83	22	211	.....	.....	.....
Confectionery	717	22	2	64	72	545	12	.....	.....
Cooperage and wooden goods, not elsewhere specified	243	33	2	.....	.....	208	.....	.....	.....
Copper, tin, and sheet-iron products	733	461	.....	197	.....	74	.....	1	.....
Cotton goods, including cotton small wares	1,500	.....	.....	.....	.....	307	1,193	.....	.....
Flour-mill and gristmill products	1,216	108	.....	2	.....	281	200	025	.....
Food preparations	284	4	.....	35	.....	221	.....	24	.....
Foundry and machine-shop products	2,925	50	283	1,772	35	773	4	8	.....
Furniture and refrigerators	701	17	.....	480	21	183	.....	.....	.....
Gas, illuminating and heating	575	10	.....	33	65	186	134	45	102
Ice, manufactured	1,437	36	16	.....	46	121	97	181	940
Leather goods	721	6	1	32	382	300	.....	.....	.....
Lime	348	8	.....	.....	.....	291	.....	.....	49
Liquors, malt	765	273	.....	24	406	2	.....	.....	.....
Lumber and timber products	23,518	632	355	784	315	16,961	4,471	.....	.....
Marble and stone work	905	333	50	110	37	66	.....	.....	.....
Mattresses and spring beds	233	14	.....	71	10	138	.....	.....	.....
Oil, cottonseed, and cake	3,073	33	.....	.....	.....	206	110	2,565	159
Patent medicines and compounds and druggists' preparations	145	61	3	24	33	24	.....	.....	.....
Pottery, terra-cotta, and fire-clay products	420	1	.....	.....	.....	410	.....	.....	.....
Printing and publishing	4,408	2,191	608	750	320	497	29	4	.....
Rice, cleaning and polishing	430	.....	.....	.....	.....	164	160	106	.....
Salt	162	1	.....	.....	.....	23	70	.....	59
Slaughtering and meat packing	3,639	9	.....	1,631	.....	1,949	.....	.....	50
Tobacco manufactures	330	217	85	20	3	14	.....	.....	.....
All other industries	6,249	392	85	1,198	302	1,099	370	545	1,352

It is evident from these figures that for the majority of wage earners employed in the manufacturing industries of Texas the prevailing hours of labor range from 54 to 60 a week, 12 per cent of the total number being employed in establishments where less than 54 hours a week prevail and 21.8 per cent in establishments where more than 60 hours a week prevail.

It will be noted that the cottonseed-oil industry is mainly on a 72-hour basis, but relatively long hours might be expected in a seasonal industry where the operations for the entire year are confined to about seven months. The prevailing hours in the cotton-goods industry are between 60 and 72 hours a week; in the lumber and timber products industry, 60 hours

a week; and in the steam-railroad repair shops and the foundries and machine shops, 54 hours a week.

**Location of establishments.**—The next table shows to what extent the manufactures of Texas are centralized in cities of 10,000 inhabitants or over. (See

Introduction.) The comparison of the statistics is confined here, as in other states, to the years 1899 and 1909, in the absence of a Federal census of population by which the grouping of cities in 1904 could be determined.

ITEM.	Year.	Aggregate.	CITIES HAVING A POPULATION OF 10,000 AND OVER.						DISTRICTS OUTSIDE OF CITIES HAVING A POPULATION OF 10,000 AND OVER.	
			Total.		10,000 to 25,000.		25,000 to 100,000.		Number or amount.	Percent of total.
			Number or amount.	Percent of total.	Number or amount.	Percent of total.	Number or amount.	Percent of total.		
Population.....	1010	3,896,542	620,712	15.9	147,337	3.8	473,375	12.1	3,275,830	84.1
	1900	3,048,710	299,398	9.8	94,320	3.1	205,009	6.7	2,740,312	90.2
Number of establishments.....	1909	4,588	1,614	35.2	350	7.6	1,264	27.6	2,074	64.8
	1899	3,107	870	28.3	276	8.9	603	19.4	2,228	71.7
Average number of wage earners.....	1909	70,230	26,303	37.5	6,286	0.0	20,017	28.5	43,927	62.5
	1899	38,004	14,647	37.9	3,569	9.2	11,078	28.7	23,957	62.1
Value of products.....	1909	\$272,805,035	\$109,559,457	40.1	\$19,928,547	7.3	\$89,639,510	32.8	\$163,336,578	59.9
	1899	92,894,433	37,036,220	39.9	6,904,458	7.4	30,131,771	32.4	55,888,204	60.1
Value added by manufacture.....	1909	94,717,120	42,844,670	45.2	7,074,011	7.5	35,770,050	37.8	51,872,150	54.8
	1899	38,506,130	16,410,242	42.6	2,004,238	7.8	13,416,004	34.8	22,095,888	57.4

In 1909, 40.1 per cent of the total value of products was reported from cities having over 10,000 inhabitants, and 37.5 per cent of the average number of wage earners were employed in such cities. The figures indicate that during the decade the industries of the cities referred to gained slightly in value of products on those of the districts outside.

The increase in the population of different cities has affected the grouping in the table. In 1900 Austin, El Paso, and Waco were in the first group, but during the following decade the population of each increased so that in 1910 they fell into the second group. In 1900 the cities of Beaumont, Brownsville, Cleburne, Marshall, Palestine, Paris, San Angelo, Temple, and Tyler each had less than 10,000 inhabitants, and so were included in the outside districts. The total value of products reported for these nine cities in 1909 was \$13,717,717, and represented 5 per cent of the total shown for all manufactures of the state. The shifting of these cities from the outside to the city districts has, therefore, affected the showing in the table.

The population for 1910 and 1900 of the 20 cities which had 10,000 inhabitants or over in 1910 is given in the following statement:

CITY.	1910	1900	CITY.	1910	1900
San Antonio.....	96,614	53,321	Demison.....	13,632	11,807
Dallas.....	92,104	42,638	Sherman.....	12,412	10,243
Houston.....	78,800	44,633	Marshall.....	11,452	7,855
Fort Worth.....	73,312	26,638	Paris.....	11,260	9,358
El Paso.....	39,279	15,006	Temple.....	10,993	7,065
Galveston.....	36,081	37,789	Brownsville.....	10,517	6,305
Austin.....	29,800	22,258	Palestine.....	10,482	8,207
Waco.....	26,425	20,686	Tyler.....	10,400	8,060
Beaumont.....	20,640	9,427	Cleburne.....	10,364	7,403
Laredo.....	14,855	13,420	San Angelo.....	10,321	( <sup>1</sup> )

<sup>1</sup> Not incorporated in 1900.

The relative importance in manufactures of each of the 20 cities having a population of 10,000 or over in

1910 is shown in the following table, in which the value of products and average number of wage earners are shown separately for 1909, 1904, and 1899:

CITY.	AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.		
	1909	1904	1899	1909	1904	1899
Dallas.....	4,882	3,446	2,842	\$20,958,664	\$15,027,068	\$9,488,252
Houston.....	5,338	5,050	3,188	23,015,556	13,564,019	7,491,971
San Antonio.....	3,105	2,457	2,683	13,434,897	7,492,262	5,988,681
Fort Worth.....	2,050	1,423	943	8,660,882	5,608,391	3,487,544
Galveston.....	1,004	761	1,422	6,308,076	2,996,054	3,675,323
Beaumont.....	863	732	1,005	4,830,501	2,609,829	1,613,352
Waco.....	1,033	947	1,004	4,769,358	2,979,800	2,293,631
Sherman.....	273	307	314	4,675,971	2,644,086	1,461,469
El Paso.....	1,752	1,158	716	3,637,577	2,377,813	1,213,009
Austin.....	754	641	495	2,845,500	1,509,353	764,748
Marshall.....	977	( <sup>2</sup> )	( <sup>2</sup> )	1,787,146	( <sup>2</sup> )	( <sup>2</sup> )
Cleburne.....	825	( <sup>2</sup> )	( <sup>2</sup> )	1,576,572	( <sup>2</sup> )	( <sup>2</sup> )
Paris.....	541	210	263	1,420,943	854,930	743,320
Temple.....	366	( <sup>2</sup> )	( <sup>2</sup> )	1,345,770	( <sup>2</sup> )	( <sup>2</sup> )
Demison.....	833	725	668	1,313,785	1,234,956	840,302
Palestine.....	745	544	481	1,312,845	735,102	704,152
Tyler.....	484	308	431	996,243	628,666	681,604
San Angelo.....	115	( <sup>3</sup> )	( <sup>3</sup> )	317,801	( <sup>3</sup> )	( <sup>3</sup> )
Laredo.....	213	515	372	221,074	453,974	331,200
Brownsville.....	51	( <sup>2</sup> )	( <sup>2</sup> )	120,746	( <sup>2</sup> )	( <sup>2</sup> )

<sup>1</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

<sup>2</sup> Figures not available.

<sup>3</sup> Not incorporated in 1900.

With the exception of Laredo, each city for which comparative figures are available shows an increase in the value of its manufactured products from 1904 to 1909, and all except Galveston (which was almost destroyed by a tidal wave in 1900), and Tyler show an increase from 1899 to 1904. Austin showed the greatest relative increase for the decade 1899-1909, namely, 272.1 per cent; Sherman was next with 220 per cent, followed by Houston with 207.2 per cent, and El Paso with 199.9 per cent. Notwithstanding these decided gains the several cities held generally the same relative rank at each of the three censuses.

Dallas, the largest manufacturing center in the state, has for its leading industries, as measured by value of products, the slaughtering and meat packing, flour-

STATISTICS OF MANUFACTURES—SOUTH CAROLINA.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.  
THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Cen- sus.	Num- ber of estab- lish- ments.	PERSONS ENGAGED IN INDUSTRY.				Pri- mary horse- power.	Capital.	Sala- ries.	Wages.	Cost of mate- rials.	Value of prod- ucts.	Value added by manu- fac- ture.
			Total.	Pro- pri- etors and firm mem- bers.	Sala- ried em- ploy- ees.	Wage earn- ers (aver- age num- ber).							
Expressed in thousands.													
<b>STATE—All industries</b> .....	<b>1909</b>	<b>1,854</b>	<b>78,040</b>	<b>1,787</b>	<b>3,257</b>	<b>73,048</b>	<b>276,378</b>	<b>\$178,221</b>	<b>\$3,756</b>	<b>\$20,361</b>	<b>\$66,851</b>	<b>\$113,236</b>	<b>\$46,885</b>
	<b>1904</b>	<b>1,399</b>	<b>63,071</b>	<b>1,241</b>	<b>2,389</b>	<b>59,441</b>	<b>197,479</b>	<b>118,422</b>	<b>2,355</b>	<b>13,869</b>	<b>49,969</b>	<b>79,376</b>	<b>29,407</b>
	<b>1899</b>	<b>1,369</b>	<b>63,071</b>	<b>1,241</b>	<b>1,419</b>	<b>47,025</b>	<b>112,697</b>	<b>62,760</b>	<b>1,308</b>	<b>8,130</b>	<b>30,486</b>	<b>53,336</b>	<b>22,860</b>
Bread and other bakery products.....	1909	63	521	65	87	369	218	394	39	119	724	1,100	376
	1904	52	397	57	29	311	132	278	19	99	370	618	248
	1899	35	312	39	27	246	.....	285	12	76	323	325	202
Brick and tile.....	1909	45	990	50	52	888	2,824	935	37	233	268	731	463
	1904	47	903	52	36	875	2,531	517	20	184	177	656	479
	1899	76	1,293	107	41	1,145	2,342	341	20	241	132	573	441
Canning and preserving.....	1909	15	495	14	14	467	95	280	19	64	159	318	159
	1904	14	1,080	16	20	1,044	287	202	14	112	349	574	225
	1899	14	.....	.....	7	126	.....	36	1	13	20	51	31
Carriages and wagons and materials.....	1909	23	317	25	20	272	272	453	25	104	244	464	220
	1904	38	404	42	10	346	320	502	20	118	290	548	258
	1899	56	.....	.....	14	340	.....	314	12	91	206	414	208
Cars and general shop construction and repairs by steam-railroad companies.....	1909	10	1,433	.....	65	1,418	1,029	518	62	687	746	1,499	753
	1904	8	1,222	.....	91	1,131	510	300	64	577	433	1,081	648
	1899	6	803	.....	27	776	413	355	21	363	204	691	397
Clothing, men's, including shirts.....	1909	5	115	1	15	99	39	113	11	20	94	139	45
	1904	5	138	4	9	125	18	54	4	25	76	137	61
	1899	5	195	7	12	170	10	128	5	37	187	306	119
Coffins, burial cases, and undertakers' goods...	1909	4	90	3	10	77	285	130	9	27	62	127	65
	1904	3	104	.....	12	92	125	156	8	25	38	126	88
	1899	3	66	4	4	58	.....	72	4	14	33	64	31
Copper, tin, and sheet-iron products.....	1909	8	92	8	5	79	54	100	3	35	106	200	94
	1904	5	27	2	1	24	10	24	1	15	13	40	27
	1899	8	.....	.....	7	56	.....	30	4	24	66	116	61
Cotton goods, including cotton small wares....	1909	147	46,342	3	885	45,454	187,716	125,549	1,460	11,661 <sup>6</sup>	41,303	65,930	24,627
	1904	127	38,038	6	761	37,271	133,397	82,337	1,008	7,702	34,308	40,438	15,130
	1899	80	30,621	5	415	30,201	73,042	39,259	537	5,007	17,264	20,724	12,400
Fertilizers.....	1909	26	2,057	2	204	1,851	4,766	11,857	338	671	5,629	9,025	3,396
	1904	20	1,221	1	149	1,071	4,286	7,087	153	304	2,692	3,638	946
	1899	22	1,862	5	85	1,772	3,940	10,505	165	479	3,108	4,883	1,775
Flour-mill and gristmill products.....	1909	10	44	9	12	23	406	110	7	7	308	351	43
	1904	29	103	29	14	60	1,440	206	7	18	633	725	92
	1899	26	.....	.....	18	94	.....	205	8	25	734	869	135
Foundry and machine-shop products.....	1909	34	477	20	40	417	817	703	45	194	178	547	369
	1904	37	517	39	28	450	1,122	511	29	212	171	542	371
	1899	26	369	27	18	324	404	316	17	141	107	463	263
Gas, illuminating and heating.....	1909	12	163	1	35	127	207	1,431	34	52	114	334	220
	1904	4	124	.....	16	108	43	1,153	11	31	59	193	134
	1899	4	127	.....	23	104	33	961	12	30	38	172	134
Hosiery and knit goods.....	1909	7	864	3	22	839	597	755	26	152	334	655	321
	1904	14	1,103	5	40	1,058	890	824	30	187	586	1,079	493
	1899	6	377	3	15	359	501	345	14	71	238	392	154
Ice, manufactured.....	1909	32	287	22	47	218	2,964	1,041	44	85	129	433	301
	1904	18	144	8	25	111	1,835	712	23	45	75	244	169
	1899	13	93	7	13	73	1,074	407	10	24	37	116	79
Lumber and timber products.....	1909	851	16,330	1,042	684	14,604	49,400	15,010	713	4,378	3,981	13,141	9,160
	1904	502	11,654	621	392	10,641	29,490	8,194	347	2,873	2,506	8,279	5,773
	1899	519	.....	.....	274	7,117	.....	3,882	168	1,503	2,431	5,959	3,528
Marble and stone work.....	1909	36	315	41	38	236	142	218	30	120	144	426	282
	1904	18	51	9	3	39	2	39	2	15	28	67	39
	1899	11	.....	.....	10	137	.....	265	8	46	34	113	70
Mattresses and spring beds.....	1909	4	56	1	9	46	77	76	9	12	64	107	43
	1904	5	69	3	7	59	69	73	6	14	61	97	36
	1899	5	.....	.....	15	59	.....	62	9	13	58	115	57
Oil, cottonseed, and cake.....	1909	103	2,190	16	409	1,765	17,730	6,880	333	467	8,720	10,903	2,183
	1904	100	1,626	3	341	1,282	14,500	5,177	233	320	4,553	5,463	610
	1899	50	914	18	162	734	5,766	1,960	109	144	2,363	3,193	740
Printing and publishing.....	1909	161	1,294	171	289	834	603	1,664	230	412	340	1,601	1,261
	1904	150	985	161	201	623	293	945	152	268	214	1,038	824
	1899	120	834	125	84	625	.....	680	62	236	188	789	601
Turpentine and rosin.....	1909	56	524	63	18	443	2	120	9	101	164	400	242
	1904	79	265	87	9	169	9	92	4	37	374	574	200
	1899	132	1,093	171	36	886	.....	269	8	136	471	785	317
All other industries.....	1909	202	2,994	177	297	2,520	6,135	4,869	273	760	2,540	4,799	2,250
	1904	134	2,836	96	189	2,551	6,165	4,039	191	688	1,963	4,219	2,256
	1899	152	.....	.....	112	1,617	.....	2,064	102	353	2,095	3,170	1,075

<sup>1</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.  
<sup>2</sup> Excluding statistics for two establishments, to avoid disclosure of individual operations.

STATISTICS OF MANUFACTURES—SOUTH CAROLINA.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Cen- sus.	Number of estab- lish- ments.	PERSONS ENGAGED IN INDUSTRY.				Pri- mary horse- power.	Capital.	Sala- ries.	Wages.	Cost of mate- rials.	Value of prod- ucts.	Value added by manu- fac- ture.
			Total.	Pro- pri- etors and firm mem- bers.	Sala- ried em- ploe- ees.	Wage earn- ers (Aver- age num- ber).							
Expressed in thousands.													
CHARLESTON—All Industries .....	1909	116	3,375	76	425	2,874	4,894	\$6,578	\$396	\$1,013	\$4,299	\$6,951	\$2,722
	1904	108	3,888	78	360	3,450		5,807	338	1,054	3,748	6,007	2,259
	1899	104			221	3,187		5,898	206	919	3,507	5,713	2,206
Bread and other bakery products.....	1909	20	342	20	69	253	137	264	31	81	505	750	245
	1904	23	306	27	27	252		221	18	83	276	457	182
	1899	25	267	29	26	212		246	12	65	290	403	173
Carrriages and wagons and materials .....	1909	3	61	3	3	55	21	23	3	20	24	58	34
	1904	3	45	4	1	40		15	1	10	11	40	29
	1899												
Foundry and machine-shop products.....	1909	5	152	3	13	136	269	298	19	66	41	166	125
	1904	4	194	1	11	182		210	14	112	65	243	178
	1899	4	178	1	10	167		170	13	88	90	223	133
Ice, manufactured .....	1909	4	27	1	4	22	640	253	5	13	21	74	50
	1904	4	41		3	38		307	3	10	33	72	39
	1899												
Lumber and timber products.....	1909	9	364	3	37	324	898	454	38	100	277	497	220
	1904	8	405	7	29	369		455	35	98	202	404	202
	1899	10	272	7	20	246		322	18	86	208	404	196
Printing and publishing.....	1909	18	306	14	94	198	465	451	82	110	110	468	358
	1904	15	228	10	84	134		286	66	67	72	279	207
	1899	13	250	16	33	201		272	27	90	90	331	241
All other industries.....	1909	57	2,123	32	205	1,886	2,304	4,827	218	623	3,218	4,938	1,600
	1904	51	2,669	20	205	2,435		4,313	201	650	3,060	4,512	1,422
	1899	52			132	2,362		4,370	136	581	2,730	4,202	1,463

CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES COMBINED.

Columbia.....	1909	55	2,788	33	243	2,522	7,784	\$7,705	\$259	\$927	\$3,578	\$5,872	\$2,294
	1904	41	2,573	25	155	2,393		4,745	176	768	2,642	4,677	2,035
	1899	41			75	2,091		3,879	93	519	1,848	3,134	1,286
Greenville.....	1909	41	1,324	29	113	1,182	2,574	1,030	98	365	1,228	2,142	914
	1904	30	1,303	26	73	1,204		2,059	40	257	1,101	1,677	576
	1899	22			36	770		1,081	36	145	718	966	248
Spartanburg.....	1909	36	1,916	25	118	1,773	4,965	4,471	126	490	2,085	3,276	1,191
	1904	35	1,745	26	69	1,650		2,869	72	348	1,544	2,128	584
	1899	28			33	1,361		2,335	41	270	907	1,591	684

<sup>1</sup> Figures can not be shown without disclosing individual operations.

<sup>2</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Primary horse-power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners.			Total.	16 and over.		Under 16.				
					Male.	Female.	Average number.	Number.			Male.	Female.	Male.	Female.			
								Maximum month.	Minimum month.								
1 All industries.....	1,854	78,040	1,737	1,596	1,393	268	78,046	Mh 76,373	Je 70,283	(1)	(1)	(1)	(1)	(1)	276,378		
2 Agricultural implements.....	4	24	5	2	1	1	15	Ap 20	No 11	15	15				53		
3 Bread and other bakery products.....	63	521	65	21	32	34	369	No 391	Ja 353	373	296	46	23	8	218		
4 Brick and tile.....	45	999	50	39	9	4	888	Au 1,230	Fe 510	1,220	1,157				2,824		
5 Canning and preserving.....	15	495	14	11	2	1	467	Mh 974	Je 2	1,088	374	552	82	80	95		
6 Carriages and wagons and materials.....	23	317	25	9	8	3	272	De 291	Au 245	291	258	5	28		272		
7 Cars and general shop construction and repairs by steam-railroad companies.....	10	1,483		8	55	2	1,418	De 1,503	Fe 1,300	1,503	1,501	1	1		1,020		
8 Cars and general shop construction and repairs by street-railroad companies.....	4	45		4	3		38	Ap 39	Au 37	39	37	2			85		
9 Clothing, men's, including shirts.....	5	115	1	8	7		99	Se 137	Ja 65	131	21	108	1	1	30		
10 Coffins, burial cases, and undertakers' goods.....	4	90	3	2	7	1	77	Oc 89	Ja 64	88	88				285		
11 Confectionery.....	11	35	12	1			22	De 24	Fe 20	24	19	4	1		5		
12 Copper, tin, and sheet-iron products.....	8	92	8	1	1		79	Je 90	No 74	77	75		2		54		
13 Cotton goods, including cotton small wares.....	147	46,342	3	443	370	72	45,454	Jy 46,300	Ja 44,669	46,065	26,063	11,386	4,843	3,773	187,716		
14 Fertilizers.....	26	2,057	2	67	127	10	1,851	Mh 4,356	Jy 922	1,669	1,668	1			4,766		
15 Flour-mill and gristmill products.....	10	44	9	8	3	1	23	Fe 26	Se 21	26	26				406		
16 Foundry and machine-shop products.....	34	477	20	24	12	4	417	Au 441	Je 308	436	425	11			817		
17 Gas, illuminating and heating.....	12	163	1	11	20	4	127	De 143	Au 115	143	143				207		
18 Hosiery and knit goods.....	7	864	3	12	8	2	839	Ja 863	No 807	822	293	376	68	86	597		
19 Ice, manufactured.....	32	287	22	36	8	3	218	Jy 339	Ja 121	250	243		7		2,964		
20 Leather goods.....	3	13	4				9	Ja 3	De 9	9	9				4		
21 Lumber and timber products.....	851	16,330	1,042	397	253	34	14,004	De 15,967	Jy 13,704	18,127	17,847	17	203		49,400		
22 Marble and stone work.....	36	315	41	9	27	2	236	Se 240	Ja 207	250	245		5		142		
23 Mattresses and spring beds.....	4	56	1	5	2	2	46	Se 52	Ja 39	49	43	6			77		
24 Oil, cottonseed, and cake.....	103	2,190	16	249	150	10	1,765	De 2,888	Au 521	2,855	2,851	3	1		17,730		
25 Patent medicines and compounds and druggists' preparations.....	7	51	11	5	18	7	10	De 12	Je 8	13	13						
26 Printing and publishing.....	161	1,294	171	80	167	42	834	My 848	Jy 816	851	608	128	52	3	603		
27 Turpentine and rosin.....	56	524	63	15	3		443	Se 544	Ja 232	580	556	20	10		2		
28 Wood distillation, not including turpentine and rosin.....	3	28		5	3	1	19	De 35	Au 10	35	35				675		
29 All other industries <sup>4</sup> .....	170	2,798	145	124	94	28	2,407								5,313		

<sup>1</sup> No figures given for reasons explained in the Introduction, page 2. See also discussion of wage earners on page 6.

<sup>2</sup> Same number reported for one or more other months.

<sup>3</sup> Same number reported for entire year.

<sup>4</sup> All other industries embrace—

Artificial stone.....	2	Electrical machinery, apparatus, and supplies.....	1	Rice, cleaning and polishing.....	3
Awnings, tents, and sails.....	3	Food preparations.....	2	Roofing materials.....	1
Bags, other than paper.....	1	Furniture and refrigerators.....	3	Shipbuilding, including boat building.....	1
Baking powders and yeast.....	1	(Glass.....	1	Slaughtering and meat packing.....	2
Baskets, and rattan and willow ware.....	2	Hand stamps, and stencils and brands.....	1	Soap.....	1
Boxes, cigar.....	1	Lead, bar, pipe, and sheet.....	1	Steam packing.....	1
Boxes, fancy and paper.....	1	Leather, tanned, curried, and finished.....	1	Tobacco manufactures.....	10
Brooms.....	4	Line.....	1	Umbrellas and canes.....	1
Clothing, women's.....	1	Liquors, malt.....	1	Upholstering materials.....	1
Coopage and wooden goods, not elsewhere specified.....	1	Mineral and soda waters.....	100	Vinegar and cider.....	1
Cordage and twine and jute and linen goods.....	3	Paint and varnish.....	1	Wirework, including wire rope and cable.....	2
Dairymen's, poulterers', and apiarists' supplies.....	1	Paper and wood pulp.....	1	Wood, turned and carved.....	1
Dyeing and finishing textiles.....	1	Paper goods, not elsewhere specified.....	1	Woolen, worsted, and felt goods, and wool huts... 1	
Dyestuffs and extracts.....	1	Paving materials.....	1		
		Pottery, terra-cotta, and fire-clay products.....	4		

STATISTICS OF MANUFACTURES—SOUTH CAROLINA.

THE STATE, BY INDUSTRIES: 1909.

	Capital.	EXPENSES.									Value of products.	Value added by manufacture.	
		Total.	Services.			Materials.		Miscellaneous.					
			Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.			Other.
1	\$178,220,870	\$97,370,829	\$2,568,601	\$1,192,087	\$20,360,750	\$3,106,324	\$63,244,550	\$117,547	\$990,309	\$420,768	\$5,374,293	\$113,235,945	\$46,885,071
2	34,500	23,411	450	535	6,050	290	12,100	178	2,500	798	36,300	23,910	
3	394,086	919,936	21,008	18,339	118,601	15,057	708,257	12,936	5,887	19,251	1,000,920	376,006	
4	935,372	585,825	31,453	5,528	232,701	188,011	70,902	3,240	44,900	730,543	402,540		
5	286,426	258,967	12,400	6,605	63,949	4,572	153,979	1,283	2,161	9,018	318,081	150,530	
6	453,150	412,481	12,595	12,428	104,925	4,026	240,354	3,076	3,112	32,865	463,506	219,186	
7	518,430	1,499,226	12,075	49,483	687,196	16,380	729,504	4,080	400	1,499,226	753,333		
8	71,475	52,657	4,372	1,956	18,807	1,156	23,306	1,000	1,880	52,657	28,105		
9	113,469	131,804	6,775	4,270	20,196	1,048	93,205	372	919	300	4,710	138,607	44,354
10	129,908	108,737	2,400	6,440	27,016	4,273	57,655	526	10,427	129,908	64,880		
11	10,856	54,669	1,000	7,983	1,144	35,875	6,548	361	1,758	71,028	34,009		
12	99,807	148,276	1,248	2,216	34,900	795	105,155	1,474	1,154	200,050	94,100		
13	125,549,218	57,614,650	1,124,211	335,851	11,660,658	1,077,500	39,325,839	500,693	148,186	2,442,613	65,029,585	24,626,147	
14	11,857,225	7,571,240	181,057	166,445	671,261	161,717	5,467,741	13,444	83,006	836,509	9,024,900	3,395,442	
15	110,091	327,463	5,000	1,070	7,000	6,185	301,966	763	4,879	350,506	42,355		
16	703,431	444,558	33,520	11,492	194,158	17,465	160,753	3,915	4,021	100	19,134	309,000	
17	1,431,202	250,050	23,959	9,920	51,638	94,005	29,044	12	11,379	39,093	333,877	210,828	
18	755,398	576,254	19,787	6,010	151,629	13,321	329,549	406	7,510	49,043	7,969	655,340	321,470
19	1,040,746	307,834	38,565	5,747	84,882	89,520	39,043	212	8,330	2,051	36,484	432,666	304,103
20	23,733	27,956	5,324	46	21,800	600	23,733	60	57	38,659	10,813		
21	15,000,640	10,214,597	512,804	199,927	4,377,760	35,320	3,046,148	14,651	68,921	178,983	880,083	13,140,886	0,150,418
22	218,378	314,904	8,956	20,570	120,072	3,556	140,405	2,326	1,728	4,654	12,537	425,071	281,520
23	75,536	96,171	5,600	2,950	12,093	1,360	62,704	60	429	97	10,968	107,300	43,236
24	6,880,240	10,007,508	232,252	109,449	466,837	316,344	8,403,191	6,338	49,168	6,636	425,383	10,902,035	2,183,400
25	46,153	69,074	7,180	9,447	4,308	48	29,613	1,400	1,138	15,940	90,943	61,282	
26	1,664,485	1,207,074	100,829	128,914	411,586	22,014	317,905	24,855	11,984	26,926	162,051	1,600,501	1,200,672
27	128,727	303,087	7,750	1,165	100,791	1,000	162,777	2,202	27,483	406,286	242,500		
28	70,436	41,246	4,700	2,700	8,692	4,325	13,650	140	1,000	6,030	51,878	33,903	
29	4,599,733	3,805,994	151,655	91,630	710,217	125,020	2,270,860	23,579	117,120	292	315,612	4,459,909	2,064,020

## MANUFACTURES : SOUTH DAKOTA

## STATISTICS OF MANUFACTURES FOR THE STATE, CITIES, AND INDUSTRIES

Prepared under the supervision of W. M. STEUART, Chief Statistician for Manufactures

## INTRODUCTION.

This bulletin gives the statistics of manufactures for the state of South Dakota for the calendar year 1909 as shown by the Thirteenth Census. It will be reprinted without change as a part of the state Compendium of the Census for South Dakota, and in the final reports of the Thirteenth Census.

The text summarizes the general results of the census inquiry, presenting a series of special tables in which the main facts printed in the general tables are given in convenient form for the state as a whole and for important industries. It also presents tables in which the statistics for the industries of the state as a whole and for a few important industries are classified by character of ownership, size of establishments, number of wage earners, and prevailing hours of labor, information which could not be presented in general tables for each industry without disclosing the facts for individual establishments.

At the end of the bulletin are two general tables.

Table I gives for 1909, 1904, and 1899 the number of establishments and of persons engaged in the industries, primary power, capital, salaries and wages, cost of materials, value of products, and value added by manufacture reported for all industries combined and for certain important industries for the state as a whole. It also gives the same items for all industries combined for Sioux Falls and Aberdeen, cities which had in 1910 a population of over 10,000 but less than 50,000.

Table II gives statistics in greater detail for 1909 for the state and for a larger number of industries.

**Scope of census: Factory industries.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of organization, location of establishments, size of establishments, labor force, and similar subjects. When use is made of the data for these purposes it is imperative that due attention should be given to the limitations of the figures. Particularly is this true when the attempt is made to derive from them figures purporting to show average wages, cost of production, or profits. These limitations will be fully discussed in the general report on manufactures for the United States as a whole. It is impossible to reproduce such discussion in the bulletins relative to the individual states.

The census of 1909, like that of 1904, was confined to manufacturing establishments conducted under the factory system, as distinguished from the neighborhood, hand, and building industries. Where statistics for 1899 are given they have been reduced to a comparable basis by eliminating the latter classes of industries.

The census does not include establishments which were idle during the entire year, or had a value of products of less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions, or in governmental establishments, except those of the Federal Government.

**Period covered.**—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—The term "establishment" comprises the factories, mills, or plants which are under a common ownership or control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment as thus defined were not all located within the same city or state, separate reports were secured in order that the separate totals might be included in the statistics for each city or state. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products very different from those covered by the class designation, and, on the other hand, may not include the total product covered by this designation, because some part of this product may be made in establishments in which it is not the product of chief value.

**Selected industries.**—The general tables at the end of this bulletin give the principal facts separately for the industries of the state. A selection has been made of the leading industries of the state for more detailed consideration. Sometimes an industry of greater importance than some of those selected is omitted because it comprises so few establishments that these detailed presentations would reveal the operations of individual concerns.

**Comparisons with previous censuses.**—Owing to the changes in industrial conditions it is not always possible to classify establishments by industries in such a way as to permit accurate comparison with preceding censuses. Table I, giving comparable figures for 1909, 1904, and 1899, therefore, does not embrace all the industries shown for 1909 in Table II.

**Influence of increased prices.**—In considering changes in cost of materials, value of products, and value added by manufacture, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures can not be taken as an exact measure of increase in the volume of business.

**Persons engaged in industry.**—At the censuses of 1909, 1904, and 1899, the following general classes of persons engaged in manufacturing industries have been distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks, and (5) wage earners. In the censuses of 1904 and 1899 these five classes were shown according to the three main groups: (1) Proprietors and firm members, (2) salaried officials, clerks, etc., and (3) wage earners. The second group included the three classes of salaried officers of corporations, superintendents and managers, and clerks. In the present census an entirely different

grouping is employed: That into (1) proprietors and officials, (2) clerks, and (3) wage earners. The first group includes proprietors and firm members, salaried officers of corporations, and superintendents and managers.

At this census the number of persons engaged in the industries, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for December 15, or the nearest representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where conditions were exceptional, and particularly in the case of certain seasonal industries, the December date could not be accepted as typical and an earlier date had to be chosen.

In the case of employees other than wage earners the number thus reported on December 15 or other representative day has been treated as equivalent to the average for the year, since the number of employees of this class does not vary much from month to month in a given industry. In the case of wage earners the average is obtained in the manner explained in the next paragraph.

**Wage earners.**—In addition to the report by sex and age of the number of wage earners on December 15 or other representative day, a report was obtained of the number employed on the 15th of each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because in view of the variations of date such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In particular, totals by sex and age for the wage earners reported for the representative day would be misleading because of the undue weight given to seasonal industries, in some of which, such as canning and preserving, the distribution of the wage earners by sex and age is materially different from that in most industries of more regular operation. In order to determine as nearly as possible the sex and age distribution of the average number of wage earners in the state as a whole, the following procedure has been adopted:

The percentage distribution by sex and age of the wage earners in each industry, for December 15 or the nearest representative day, has been calculated from the actual numbers reported for that date. This percentage has been applied to the average number of wage earners for the year in that industry, to determine the average number of men, women, and children employed. These calculated averages for the several industries have been added up to give the average distribution for the state as a whole.

In 1899 and 1904 the schedule called for the average number of wage earners of each sex 16 years and over, and the total number under 16 years of age, for each month, and these monthly statements were combined in an annual average. Comparatively few manufacturing concerns, however, keep their books in such way as to show readily the number of men, women, and children (under 16) employed each month. These monthly returns by sex and age were, in fact, largely estimates. It was believed that a more accurate and reliable sex and age distribution could be secured by taking as a basis of estimate the actual numbers employed on a single day.

**Prevailing hours of labor.**—The census made no attempt to ascertain the number of employees working a given number of hours per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and no

attention is given to the fact that a limited number of employees may have hours differing from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

**Capital.**—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

**Materials.**—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term materials includes fuel, rent of power and heat, mill supplies, and containers, as well as materials forming a constituent part of the product. Fuel includes all fuel used, whether for heat, light, or power, or for the process of manufacture.

**Expenses.**—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness, dividends on stock, and allowances for depreciation.

**Value of products.**—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

**Value added by manufacture.**—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishments. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "value added by manufacture."

**Cost of manufacture and profits.**—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products the rate of profit on the investment could not properly be calculated, because of the very defective character of the returns regarding capital.

**Primary power.**—The figures given for this item show the total of the primary power used by the establishments. They do not cover the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

**Location of establishments.**—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the fact that often establishments are located just outside the boundaries

of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

**Laundries.**—The census of 1909 was the first to include statistics of laundries. The reports are confined to establishments using mechanical power. The data are presented separately and are not

included in the general total for manufacturing industries, in order to avoid interference with comparisons with prior censuses.

**Custom grist and saw mills.**—In order to make the statistics for 1909 comparable with those for 1904 the data for these mills have been excluded from all the tables presenting general statistics, and are given in a separate table at the end of this report.

**INDUSTRIES IN GENERAL.**

**General character of the state.**—South Dakota ranks fourteenth in size among the states and territories of continental United States, having an area of 77,650 square miles, of which 76,850 square miles represent land surface. Its population in 1910 was 583,888, as compared with 401,570 in 1900 and 348,600 in 1890. It ranked thirty-sixth among the 49 states and territories as regards population in 1910 and thirty-eighth in 1900.

Lying in the Great Plains region and, with the exception of the Black Hills district, consisting of rolling upland, South Dakota is essentially an agricultural state. In 1910 only 13.1 per cent of the entire population of the state resided in incorporated cities and towns having a population of 2,500 or over, as against 10.2 per cent in 1900. The density of population in 1910 was 7.6 persons per square mile, as compared with 5.2 in 1900. Sioux Falls and Aberdeen were the

only cities with a population of more than 10,000 in 1910. The eastern part of the state and the mining region of the southwest corner are well provided with transportation facilities. Nearly every county east of the Missouri River has one or more railroads.

**Importance and growth of manufactures.**—The agricultural and mining industries of South Dakota are of much more importance than its manufactures. The increase, however, in the number of manufacturing establishments from 1899 to 1909, and that in the average number of wage earners engaged in manufactures, has kept pace with the general increase in population.

The following table gives the more important figures relative to all classes of manufactures combined for the state as returned at the censuses of 1909, 1904, and 1899, together with percentages of increase from census to census:

	NUMBER OR AMOUNT.			PER CENT OF INCREASE.	
	1909	1904	1899	1904-1909	1899-1904
Number of establishments.....	1,020	686	624	48.7	9.9
Persons engaged in manufactures.....	5,226	3,582	( <sup>1</sup> )	45.9	( <sup>1</sup> )
Proprietors and firm members.....	942	649	( <sup>1</sup> )	45.1	( <sup>1</sup> )
Salaried employees.....	682	441	288	54.6	53.1
Wage earners (average number).....	3,602	2,492	2,224	44.5	12.0
Primary horsepower.....	17,666	11,154	11,775	58.4	<sup>2</sup> 5.3
Capital.....	\$13,018,000	\$7,585,000	\$6,051,000	71.6	25.4
Expenses.....	15,787,000	11,246,000	8,155,000	40.4	37.9
Services.....	2,914,000	1,716,000	1,305,000	69.8	31.5
Salaries.....	616,000	294,000	175,000	109.5	68.0
Wages.....	2,298,000	1,422,000	1,130,000	61.6	25.8
Materials.....	11,476,000	8,697,000	6,484,000	32.0	34.1
Miscellaneous.....	1,397,000	833,000	366,000	67.7	127.6
Value of products.....	17,870,000	13,085,000	9,530,000	36.6	37.3
Value added by manufacture (value of products less cost of materials).....	6,394,000	4,388,000	3,046,000	45.7	44.1

<sup>1</sup> Figures not available.

<sup>2</sup> Decense.

In 1909 the state of South Dakota had 1,020 manufacturing establishments operating under the factory system, which gave employment to an average of 5,226 persons during the year and paid out \$2,914,000 in salaries and wages. Of the persons employed, 3,602 were wage earners. These establishments turned out products to the value of \$17,870,000, to produce which materials costing \$11,476,000 were consumed. The value added by manufacture was thus \$6,394,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year:

During the last five years the percentages of increase in value of products, value added by manufacture,

total expenses, and cost of materials were about the same as in the preceding five years (1899 to 1904), but the percentages of increase in the number of wage earners and the amount paid in wages were considerably greater.

As pointed out in the Introduction, it would be improper to infer that manufactures increased in volume during the period 1904-1909 to the extent indicated by these figures regarding values, since the increase shown is certainly due, in part, to the increase that has taken place in the price of commodities.

The relative importance and growth of the leading manufacturing industries of the state are shown in the table following.

## STATISTICS OF MANUFACTURES—SOUTH DAKOTA.

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.		PER CENT OF INCREASE. <sup>1</sup>			
		Average number.	Percent distribution.	Amount.	Percent distribution.	Amount.	Percent distribution.	Value of products.		Value added by manufacture.	
								1901-1909	1899-1904	1901-1909	1899-1904
<b>All industries</b> .....	<b>1,020</b>	<b>3,602</b>	<b>100.0</b>	<b>\$17,870,000</b>	<b>100.0</b>	<b>\$6,394,000</b>	<b>100.0</b>	<b>36.6</b>	<b>37.3</b>	<b>45.7</b>	<b>44.1</b>
Flour-mill and gristmill products.....	95	285	7.9	6,208,000	34.7	872,000	13.6	<sup>2</sup> 4.8	103.1	<sup>2</sup> 24.0	121.6
Butter, cheese, and condensed milk.....	95	130	3.0	2,686,000	15.0	378,000	5.9	23.0	82.1	8.0	84.4
Printing and publishing.....	392	825	22.9	1,976,000	11.1	1,520,000	23.8	61.7	63.8	55.1	67.5
Bread and other bakery products.....	92	286	7.9	1,191,000	6.5	440,000	6.9	199.2	391.1	158.8	240.0
Lumber and timber products.....	58	451	12.5	945,000	5.3	599,000	9.3	150.7	<sup>2</sup> 23.8	112.9	<sup>2</sup> 7.6
Liquors, malt.....	4	70	2.1	606,000	3.4	375,000	5.9	56.2	38.6	56.9	<sup>2</sup> 1.2
Tobacco manufactures.....	59	203	5.6	454,000	2.5	290,000	4.5	38.4	66.5	44.3	57.0
Cars and general shop construction and repairs by steam-railroad companies.....	5	327	9.1	439,000	2.5	274,000	4.3	74.9	41.0	128.3	31.9
Confectionery.....	3	166	3.0	400,000	2.2	129,000	2.0	20.5	.....	.....	.....
Gas, illuminating and heating.....	17	108	3.0	278,000	1.6	158,000	2.5	87.8	.....	58.0	.....
Artificial stone.....	38	104	2.9	253,000	1.4	133,000	2.1	301.6	.....	209.4	.....
Foundry and machine-shop products.....	37	78	2.2	225,000	1.3	152,000	2.4	1.8	.....	29.0	.....
Carriages and wagons and materials.....	10	48	1.3	131,000	0.7	71,000	1.1	322.6	<sup>2</sup> 36.7	238.1	<sup>2</sup> 27.6
Brick and tile.....	12	54	1.5	103,000	0.6	72,000	1.1	22.6	82.6	12.5	93.9
All other industries.....	103	512	14.2	2,005,000	11.2	934,000	14.6	264.5	<sup>2</sup> 81.7	160.9	<sup>2</sup> 57.5

<sup>1</sup> Per cent of increase is based on figures in Table I.<sup>2</sup> Decrease.

It should be borne in mind, in considering this table, that the value of products in some of the industries involves a certain amount of duplication, due to the use of the products of one establishment in the industry as material for another establishment.

The most important industries listed in this table, in which they are arranged in the order of the value of products, call for brief consideration.

*Flour-mill and gristmill products.*—The statistics show that this industry continues to lead in value of products, reporting in 1909 more than one-third of the total value of products for the state. Compared with the returns, however, for 1904, there has been a decrease of 4.8 per cent in the value of products and of 24.9 per cent in value added by manufacture.

*Butter, cheese, and condensed milk.*—The establishments reported for this industry are engaged primarily in the manufacture of butter, no cheese nor condensed milk being produced in 1909. This industry increased much more rapidly during the period from 1899 to 1904 than during the latter half of the decade.

*Printing and publishing.*—Over one-third of the total number of manufacturing establishments and nearly one-fourth of the total number of wage earners of the state are engaged in this industry. The 392 establishments embraced 378 publishers of newspapers and periodicals, 13 job printing offices, and one bookbinding establishment.

*Bread and other bakery products.*—An increase of nearly 200 per cent was shown in the value of the bakery products reported for 1909, as compared with 1904.

*Lumber and timber products.*—The development of this industry in South Dakota during the last five years is shown in the increase in value of products and in value added by manufacture. The former item decreased 23.8 per cent from 1899 to 1904, but increased 150.7 per cent from 1904 to 1909, and the latter item decreased 7.6 per cent during the earlier

period and increased 112.9 per cent during the later. The increase in the later five-year period is due partly to the large increase in the cut of western yellow pine during this period as well as to an advance in the price of this timber, which constitutes almost the entire lumber cut of South Dakota.

The above table shows that when these five leading industries are ranked according to value added by manufacture the order differs considerably from that when the ranking is by value of products. In value added by manufacture the leading industry is printing and publishing, which ranked third in value of products. It leads also in the number of wage earners employed.

This table shows also the percentages of increase for these leading industries in respect to value of products and value added by manufacture.

In some of the less important industries the percentage of increase in value of products from 1904 to 1909 was very large, amounting to over 300 per cent in two industries—artificial stone and carriages and wagons.

In addition to the 14 industries presented separately, there are 7 other industries each of which had a value of product in 1909 in excess of \$100,000. They are included under the head of "All other industries" because, if they were shown separately, the operations of individual establishments would be disclosed, or because the data for prior censuses are not available or comparable, or because the returns do not properly present the true condition of the industry, for the reason that it is more or less interwoven with one or more industries of similar character. These 7 industries are: Automobiles, including bodies and parts; cement; men's clothing, including shirts; copper, tin, and sheet-iron products; marble and stone work; mineral and soda water; and slaughtering and meat packing. The 1909 statistics, however, for the manufacture of copper, tin, and sheet-iron products and marble and stone work will be found in Table II.

**Persons engaged in manufacturing industries.**—The following table shows the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables, is an estimate obtained by the method described in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
<b>All classes</b> .....	<b>5,226</b>	<b>4,588</b>	<b>638</b>
Proprietors and officials.....	1,227	1,188	39
Proprietors and firm members.....	942	900	30
Salaried officers of corporations.....	96	95	1
Superintendents and managers.....	189	187	2
Clerks.....	307	255	142
Wage earners (average number).....	3,602	3,145	457
16 years of age and over.....	3,556	3,009	457
Under 16 years of age.....	46	46	

The average number of persons engaged in manufactures during 1909 was 5,226. Of these, 3,602 were wage earners. Of the remainder, about three-fourths were proprietors and officials and about one-fourth were clerks. Corresponding figures for individual industries will be found in Table II.

The following table shows the percentage of proprietors and officials, clerks, and wage earners, respectively, and the total number of persons employed in manufactures. It covers all industries combined and five important industries individually.

INDUSTRY.	Total number.	PERSONS ENGAGED IN MANUFACTURES.		
		Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
<b>All industries</b> .....	<b>5,226</b>	<b>23.5</b>	<b>7.6</b>	<b>68.9</b>
Bread and other bakery products.....	431	27.4	6.3	66.4
Butter, cheese, and condensed milk.....	252	32.1	12.7	55.2
Flour-mill and gristmill products.....	454	30.2	7.0	62.8
Lumber and timber products.....	634	13.1	2.4	84.5
Printing and publishing.....	1,387	30.1	10.5	59.5
All other industries.....	2,168	18.6	6.8	74.5

Of the total number of persons engaged in all manufacturing industries, 23.5 per cent were proprietors and officials, 7.6 per cent clerks, and 68.9 per cent wage earners. The proportion of proprietors and officials is much greater than in states where the manufacturing industries are highly developed, for the reason that in South Dakota a very large proportion of the establishments are small and the work done largely by the proprietors or by their immediate representatives.

The following table shows in percentages, for all industries combined, the distribution of the average number of wage earners by age periods and sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries

separately, the percentage distribution, by age periods and sex, of the wage earners as reported for December 15 or the nearest representative day. As a means of judging the importance of the several industries the average total number employed for the year is also given in each case.

INDUSTRY.	Average number. <sup>1</sup>	WAGE EARNERS.		
		Per cent of total.		Under 16 years of age.
		16 years of age and over.	Male.	
<b>All industries</b> .....	<b>3,602</b>	<b>86.0</b>	<b>12.7</b>	<b>1.3</b>
Bread and other bakery products.....	280	65.7	32.9	1.4
Butter, cheese, and condensed milk.....	139	95.7	4.3	
Flour-mill and gristmill products.....	285	90.6		0.4
Lumber and timber products.....	451	99.8		0.2
Printing and publishing.....	825	69.5	28.0	2.5
All other industries.....	1,616	91.0	7.8	1.2

<sup>1</sup> For method of estimating the distribution by sex and age periods, of the average number in all industries combined, see Introduction.

For all industries combined, 86 per cent of the average number of wage earners were males over 16 years of age; 12.7 per cent females over that age; and 1.3 per cent all persons under the age of 16. The largest part of the total number of female wage earners over 16 years of age and of children under that age were confined to the bakery and printing industries combined. In the bakery industry about one-third of the total wage earners employed were females, and in the printing industry about three-tenths of the total employees were of that class.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904, it is necessary to use the classification employed at the earlier census. (See Introduction.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				
	1909		1904		Per cent of increase, 1904-1909.
	Number.	Per cent distribution.	Number.	Per cent distribution.	
<b>Total</b> .....	<b>5,226</b>	<b>100.0</b>	<b>3,582</b>	<b>100.0</b>	<b>45.9</b>
Proprietors and firm members.....	942	18.0	649	18.1	45.1
Salaried employees.....	682	13.0	441	12.3	54.6
Wage earners (average number).....	3,602	68.9	2,492	69.6	44.5

Comparable figures are not obtainable for 1899. The table shows a somewhat greater percentage of increase in the salaried employees than in the other two classes.

The table following shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over, according to sex, for 1909, 1904, and 1899. The averages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

STATISTICS OF MANUFACTURES—SOUTH DAKOTA.

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Percent distribution.	Number.	Percent distribution.	Number.	Percent distribution.
Total.....	3,602	100.0	2,492	100.0	2,224	100.0
16 years of age and over..	3,556	98.7	2,459	98.7	2,114	95.1
Male.....	3,099	86.0	2,179	87.4	2,033	91.4
Female.....	457	12.7	280	11.2	81	3.6
Under 16 years of age....	46	1.3	33	1.3	110	4.9

This table indicates that very few children are employed in the manufacturing industries of the state, and that the present proportion of children is less than it was 10 years ago, although there was a slight increase in the number from 1904 to 1909.

From 1904 to 1909, as well as from 1899 to 1904, there was a proportional and actual increase in the employment of female wage earners.

Wage earners employed by months.—The following table gives the number of wage earners employed on the 15th of each month during the year 1909, for all industries combined, for the lumber industry, and for all other industries combined; it gives also the percentage which the number reported for each month is of the greatest number reported for any month. In Table II, page 14, is shown, for each industry in the state, the largest number and also the smallest number of employees reported for any month. The number for each month relates to the 15th day or the nearest representative day of that month.

MONTH.	NUMBER OF WAGE EARNERS.									
	All Industries.		Lumber and timber products.						All other industries.	
			Total.		In mills.		In logging operations.			
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January.....	3,108	79.2	331	58.0	188	50.1	143	75.3	2,777	81.1
February.....	3,235	82.4	405	82.7	275	73.3	190	100.0	2,770	80.9
March.....	3,374	86.0	490	80.5	298	78.9	100	100.0	2,888	81.3
April.....	3,373	85.9	360	65.7	240	64.0	129	67.0	3,004	87.7
May.....	3,543	90.3	380	68.7	284	75.7	102	53.7	3,157	92.2
June.....	3,703	95.0	470	84.7	343	91.5	133	70.0	3,287	96.0
July.....	3,824	97.4	515	91.0	363	96.8	152	80.0	3,309	96.6
August.....	3,779	96.3	304	70.1	201	77.6	103	54.3	3,385	98.8
September.....	3,925	100.0	500	80.0	351	93.6	149	78.4	3,425	100.0
October.....	3,860	98.3	497	88.4	335	80.3	162	85.3	3,363	98.2
November.....	3,869	98.6	562	100.0	375	100.0	187	98.4	3,307	98.6
December.....	3,572	91.0	434	77.2	291	77.0	143	75.3	3,138	91.6

The lumber industry shows more fluctuations in the number of wage earners employed than any other important industry. The greatest activity in logging operations is shown for February and March. In the mills the minimum number of wage earners was employed in January, the number fluctuating until November, when the maximum number was employed. For all industries combined the number of wage earners employed was lowest in January, and increased gradually until reaching the maximum in September.

Prevailing hours of labor.—In the following table wage earners have been classified according to hours of labor prevailing in the establishments in which they are employed. In making this classification the average number of wage earners employed during the year is used, and the number employed in each establishment is classified as a total, according to the hours prevailing in that establishment, even though some few employees work a greater or less number of hours.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All Industries.....	3,602	516	82	746	40	1,932	131	39	116
Artificial stone.....	104		3	3		98			
Bread and other bakery products.....	286	10	3	20		219	1	14	4
Brick and tile.....	54			10		44			
Butter, cheese, and condensed milk.....	139	7		18		86	20		
Carriages and wagons and materials.....	48					48			
Cars and general shop construction and repairs by steam-railroad companies.....	327					313	14		
Confectionery.....	106			33		73			
Flour-mill and gristmill products.....	285	28		9		175	48	25	
Foundry and machine-shop products.....	78	2		4		72			12
Gas, illuminating and heating.....	108	6		1	10	36	37		
Liquors, malt.....	70	15		43		18			
Lumber and timber products.....	451	8	3	13		425	2		
Marble and stone work.....	116	8		83	4	21			
Printing and publishing.....	826	207	73	447	7	91			
Tobacco manufactures.....	203	198		3		2			
All other industries.....	306	18		53	13	212			13

It appears from these figures that a majority of the wage earners employed in the manufacturing industries of South Dakota are employed 60 hours or over per week, the proportion being 61.6 per cent of all wage earners. The artificial stone industry, the bakeries, the railroad repair shops, the flour mills, and the lumber mills and logging camps were mainly on a 10-hour-per-day basis (60 hours per week). Shorter hours prevail in printing and publishing, 88.1 per cent of the total number of wage earners in that industry being employed in establishments running 54 hours or less per week. Eight hours per day were the prevailing hours in the tobacco industry.

Location of establishments.<sup>1</sup>—The next table shows the distribution of manufacturing between cities having a population of 10,000 or over and the remainder of the state.

ITEM.	Year.	Total.	LOCATION OF ESTABLISHMENTS.		PER CENT OF TOTAL.	
			In cities with population of 10,000 and over.	Outside districts.	In cities with population of 10,000 and over.	Outside districts.
Population.....	1910	583,888	24,847	550,041	4.3	95.7
	1900	401,570	10,266	391,304	2.6	97.4
Number of establishments.	1909	1,020	120	900	11.8	88.2
	1904	886	61	825	8.0	91.1
	1899	624	48	576	7.7	92.3
Average number of wage earners.	1909	3,602	972	2,630	27.0	73.0
	1904	2,492	465	2,027	18.7	81.3
	1899	2,224	311	1,913	14.0	86.0
Value of products.	1909	\$17,870,135	\$4,404,069	\$13,466,066	25.0	75.0
	1904	13,085,333	1,897,790	11,187,543	14.5	85.5
	1899	9,529,946	883,624	8,646,322	9.3	90.7
Value added by manufacture.	1909	6,393,785	1,823,764	4,570,021	28.5	71.5
	1904	4,388,502	832,097	3,556,405	19.0	81.0
	1899	3,046,269	592,096	2,454,173	18.5	81.5

At the census of 1900 Sioux Falls was the only city having over 10,000 inhabitants, but in 1910 Aberdeen became a city of that class. The population for the census of 1900 was used in grouping data for 1904 as well as for 1899. The addition, therefore, of Aberdeen in 1909 accounts in part for the relatively large increase in urban manufactures during the period 1904-1909.

Character of ownership.—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available. Figures for 1909 only are presented for five important industries.

<sup>1</sup> See Introduction.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>				
1909.....	1,020	3,602	\$17,870,135	\$6,393,785
1904.....	886	2,492	13,085,333	4,388,502
Individual:				
1909.....	583	1,045	4,047,905	1,876,363
1904.....	370	810	3,222,105	1,373,597
Firm:				
1909.....	100	425	2,027,528	908,217
1904.....	125	452	2,842,052	902,559
Corporation:				
1909.....	210	2,070	9,870,131	3,479,291
1904.....	112	1,145	6,003,547	1,943,511
Other:				
1909.....	61	50	1,024,571	129,914
1904.....	73	79	1,017,020	168,835
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
Individual:				
1909.....	57.2	29.0	22.7	29.3
1904.....	54.8	32.7	24.6	31.3
Firm:				
1909.....	15.7	11.8	16.4	14.2
1904.....	18.2	18.1	21.7	20.6
Corporation:				
1909.....	21.2	57.6	55.2	54.4
1904.....	16.3	45.0	45.9	44.3
Other:				
1909.....	6.0	1.6	5.7	2.0
1904.....	10.6	3.2	7.8	3.8
<b>Bread and other bakery products, 1909</b>				
Individual.....	92	286	\$1,160,536	\$480,170
Firm.....	60	111	470,994	160,409
Corporation.....	20	35	177,890	79,697
Other.....	3	140	511,682	168,974
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	75.0	38.8	40.6	43.4
Firm.....	21.7	12.2	15.3	18.1
Corporation.....	3.3	40.0	44.1	38.5
<b>Butter, cheese, and condensed milk, 1909</b>				
Individual.....	95	139	\$2,665,511	\$877,478
Firm.....	30	20	548,852	88,705
Corporation.....	8	17	218,840	34,402
Other.....	12	47	1,080,131	165,113
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	31.6	18.7	20.4	23.5
Firm.....	8.4	12.2	8.1	9.1
Corporation.....	12.6	33.8	38.6	43.7
Other.....	47.4	35.3	32.8	23.6
<b>Flour-mill and gristmill products, 1909</b>				
Individual.....	95	285	\$6,208,216	\$872,461
Firm.....	31	47	892,441	170,557
Corporation.....	23	64	1,250,308	200,177
Other.....	35	174	3,022,605	472,706
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	32.6	16.5	14.4	19.5
Firm.....	24.2	22.5	20.1	22.0
Corporation.....	36.8	61.1	63.5	54.2
Other.....	6.3	...	2.0	3.3
<b>Lumber and timber products, 1909</b>				
Individual.....	58	451	\$944,777	\$595,866
Firm.....	34	83	202,084	114,431
Corporation.....	9	31	110,570	82,741
Other.....	15	337	631,523	308,864
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	58.6	18.4	21.5	19.2
Firm.....	15.5	6.9	11.7	13.9
Corporation.....	25.0	74.7	66.8	66.0
<b>Printing and publishing, 1909</b>				
Individual.....	392	825	\$1,975,976	\$1,519,482
Firm.....	272	402	851,070	678,653
Corporation.....	40	71	170,221	135,884
Other.....	74	350	941,037	698,703
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	69.4	48.7	43.1	44.7
Firm.....	10.2	8.6	8.9	8.9
Corporation.....	18.9	42.4	47.0	46.0
Other.....	1.5	0.2	0.4	0.4

STATISTICS OF MANUFACTURES—SOUTH DAKOTA.

The proportion of establishments operated by firms was smaller in 1909 than in 1904 and the proportion under corporate ownership considerably larger. In addition the establishments operated by individuals and by firms reported smaller proportions of the total average number of wage earners, the total value of products, and the total value added by manufacture in 1909 than in 1904. In 1909 corporations reported more than half the totals for each of these items, a much larger proportion than they reported at the preceding census. Of the value of products reported by the flour-mill and gristmill industry and by the lumber industry, 63.5 per cent and 66.8 per cent, respectively, are returned by establishments under this form of ownership. Of the 61 establishments classified as under "other" forms of ownership, 45 were engaged in making butter and were operated under the cooperative form of ownership.

**Size of establishment.**—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it, the following table groups the establishments according to the value of their products. The table also shows the average size of establishments for all industries combined and for important industries separately, as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the last two censuses, while for certain important industries figures are given for 1909 only.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>				
1909.....	1,020	3,602	\$17,870,135	\$6,898,785
1904.....	686	2,492	13,085,833	4,888,502
Less than \$5,000:				
1909.....	533	558	1,264,398	876,341
1904.....	319	384	751,832	553,810
\$5,000 and less than \$20,000:				
1909.....	309	878	3,144,801	1,541,435
1904.....	216	687	2,202,435	1,076,446
\$20,000 and less than \$100,000:				
1909.....	142	1,056	5,652,440	1,923,529
1904.....	130	895	5,885,287	1,890,200
\$100,000 and less than \$1,000,000:				
1909.....	36	1,110	7,808,496	2,062,489
1904.....	21	526	4,245,779	888,956
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
Less than \$5,000:				
1909.....	52.3	15.5	7.1	13.7
1904.....	46.5	15.4	5.7	12.6
\$5,000 and less than \$20,000:				
1909.....	30.3	24.4	17.6	24.1
1904.....	31.5	27.6	16.8	24.5
\$20,000 and less than \$100,000:				
1909.....	13.9	29.3	31.6	30.1
1904.....	19.0	35.9	45.0	42.6
\$100,000 and less than \$1,000,000:				
1909.....	3.5	30.8	43.7	32.1
1904.....	3.1	21.1	32.4	20.3
Average per establishment:				
1909.....		4	\$17,520	\$6,268
1904.....		4	19,075	6,397

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>Bread and other bakery products, 1909.....</b>	<b>92</b>	<b>286</b>	<b>\$1,160,536</b>	<b>\$439,170</b>
Less than \$5,000.....	41	29	119,905	55,706
\$5,000 and less than \$20,000.....	44	94	408,128	171,558
\$20,000 and less than \$100,000.....	7	163	632,503	211,816
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	44.6	10.1	10.3	12.7
\$5,000 and less than \$20,000.....	47.8	32.9	35.2	39.1
\$20,000 and less than \$100,000.....	7.6	57.0	54.5	48.2
Average per establishment.....		3	\$12,615	\$4,774
<b>Butter, cheese, and condensed milk, 1909.....</b>	<b>95</b>	<b>139</b>	<b>\$2,685,611</b>	<b>\$377,478</b>
Less than \$5,000.....	6	4	16,959	3,347
\$5,000 and less than \$20,000.....	49	41	614,556	99,435
\$20,000 and less than \$100,000.....	30	63	1,215,578	151,083
\$100,000 and less than \$1,000,000.....	4	31	838,418	132,113
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	6.3	2.9	0.6	0.9
\$5,000 and less than \$20,000.....	51.6	29.5	22.9	24.1
\$20,000 and less than \$100,000.....	37.9	45.3	45.3	40.0
\$100,000 and less than \$1,000,000.....	4.2	22.3	31.2	35.0
Average per establishment.....		1	\$28,269	\$3,973
<b>Flour-mill and gristmill products, 1909.....</b>	<b>95</b>	<b>285</b>	<b>\$6,208,216</b>	<b>\$872,451</b>
Less than \$5,000.....	11	6	33,899	6,340
\$5,000 and less than \$20,000.....	22	21	285,406	58,526
\$20,000 and less than \$100,000.....	45	120	2,139,453	301,756
\$100,000 and less than \$1,000,000.....	17	138	3,749,548	415,829
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	11.6	2.1	0.5	0.7
\$5,000 and less than \$20,000.....	23.2	7.4	4.6	6.7
\$20,000 and less than \$100,000.....	47.4	42.1	34.5	44.0
\$100,000 and less than \$1,000,000.....	17.9	48.4	60.4	47.7
Average per establishment.....		3	\$65,350	\$9,184
<b>Lumber and timber products, 1909.....</b>	<b>58</b>	<b>451</b>	<b>\$944,777</b>	<b>\$595,806</b>
Less than \$5,000.....	22	30	60,845	44,767
\$5,000 and less than \$20,000.....	28	95	258,604	156,284
\$20,000 and less than \$100,000.....	5	46	183,337	91,583
\$100,000 and less than \$1,000,000.....	3	280	441,931	303,231
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	37.9	6.7	6.4	7.5
\$5,000 and less than \$20,000.....	48.3	21.1	27.4	26.2
\$20,000 and less than \$100,000.....	8.6	10.2	19.4	15.4
\$100,000 and less than \$1,000,000.....	5.2	62.1	46.8	50.9
Average per establishment.....		8	\$16,280	\$10,274
<b>Printing and publishing, 1909.....</b>	<b>392</b>	<b>825</b>	<b>\$1,975,978</b>	<b>\$1,519,483</b>
Less than \$5,000.....	316	303	603,406	577,938
\$5,000 and less than \$20,000.....	99	229	522,699	412,152
\$20,000 and less than \$100,000.....	16	233	750,871	549,372
Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	80.6	44.0	35.1	36.7
\$5,000 and less than \$20,000.....	15.3	27.8	26.5	27.1
\$20,000 and less than \$100,000.....	4.1	28.2	38.5	36.2
Average per establishment.....		2	\$5,041	\$3,876

<sup>1</sup> Includes the group "\$100,000 and less than \$1,000,000."

This table shows that, in 1909, of the 1,020 establishments, only 36, or 3.5 per cent, had a value of products exceeding \$100,000. These establishments, however, had a total average number of wage earners of 1,110, or 30.8 per cent of the total for the state; 43.7 per cent of the total value of products; and 32.1 per cent of the total value added by manufacture.

On the other hand, the very small establishments—that is, those having a value of products of less than \$5,000—represented more than one-half (52.3 per cent) of the total number of establishments, while the average number of wage earners employed in them formed only 15.5 per cent of the total, and the value of their products only 7.1 per cent.

The fact that the average value of products per establishment decreased from \$19,075 to \$17,520, and the average value added by manufacture from \$6,397 to \$6,268, is due chiefly to the disproportionate increase in the number of very small establishments. Out of a total increase of 334 establishments, there were 214 each of which had a product valued at less than \$5,000. There was no change in the average number of wage earners per establishment. Considering only the five leading industries which are included in the table, the average value of products per establishment varies from \$5,041 for the printing

and publishing industry to \$65,350 for flour and grist mills.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The next table shows such a classification for all industries combined and for five important industries, and gives not only the number of establishments falling in each group but also the average number of wage earners employed.

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All Industries	1,020	146	787	83	17	4	3			
Bread and other bakery products	92	17	71	3			1			
Butter, cheese, and condensed milk	95	0	84	2						
Flour-mill and gristmill products	95	12	70	12	1					
Lumber and timber products	58	2	46	0	1	2	1			
Printing and publishing	392	72	300	16	4					
All other industries	288	34	196	44	11	2	1			
AVERAGE NUMBER OF WAGE EARNERS.										
All Industries	3,602		1,456	835	517	310	484			
Bread and other bakery products	280		134	19			133			
Butter, cheese, and condensed milk	139		114	25						
Flour-mill and gristmill products	285		162	96	27					
Lumber and timber products	451		106	43	22	149	131			
Printing and publishing	825		538	178	109					
All other industries	1,610		402	474	350	161	220			
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All Industries	100.0		40.4	23.2	14.4	8.6	13.4			
Bread and other bakery products	100.0		46.9	6.0			46.5			
Butter, cheese, and condensed milk	100.0		82.0	18.0						
Flour-mill and gristmill products	100.0		56.8	33.7	9.5					
Lumber and timber products	100.0		23.5	9.5	4.9	33.0	29.0			
Printing and publishing	100.0		65.2	21.6	13.2					
All other industries	100.0		24.0	20.3	22.2	10.0	13.6			

The per cent distribution of the number of establishments is not shown in this table; of the 1,020 establishments reported for all industries, 89.5 per cent employed no wage earners or from 1 to 5 wage earners each, while only 3 establishments employed over 100 wage earners each.

Of the total number of wage earners, 40.4 per cent were in establishments employing from 1 to 5 wage earners each. The creamery and the printing and publishing industries are the leading industries in this group. The group of establishments employing from 6 to 20 wage earners reported 23.2 per cent of the total number of wage earners, and the 3 establishments which employed over 100 wage earners each reported 13.4 per cent of the total.

**Expenses.**—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of

the different classes of expenses going to make up the total.

The following table shows in percentages the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All Industries	3.9	14.6	72.7	8.9
Bread and other bakery products	3.0	15.3	73.1	8.6
Butter, cheese, and condensed milk	1.7	4.4	90.7	3.2
Flour-mill and gristmill products	1.4	3.2	91.1	4.3
Lumber and timber products	3.6	33.6	39.0	23.7
Printing and publishing	12.2	35.6	32.9	19.2
All other industries	6.3	25.6	56.0	12.2

This table shows that, for all industries combined, 72.7 per cent of the total expenses was incurred for

materials, 18.5 per cent for services—that is, salaries and wages—and but 8.9 per cent for other purposes. As would be expected, these proportions vary greatly in the different industries.

**Engines and power.**—The following table shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 <sup>1</sup>	1909	1904	1899 <sup>1</sup>	1909	1904	1899
Primary power, total.....	972	436	507	17,666	11,154	11,775	100.0	100.0	100.0
Owued.....	648	436	507	15,980	10,063	11,603	90.5	98.3	90.0
Steam.....	253	214	308	12,257	8,483	9,256	69.4	76.1	78.6
Gas and oil.....	366	180	158	2,784	1,397	1,270	15.8	12.5	10.8
Water wheels.....	24	31	41	927	1,060	1,000	5.2	9.5	9.3
Water motors.....	5	5	( <sup>2</sup> )	12	9	( <sup>2</sup> )	0.1	0.1	( <sup>2</sup> )
Other.....				14		38		0.1	0.3
Rented.....	324	( <sup>2</sup> )	( <sup>2</sup> )	1,686	191	112	9.5	1.7	1.0
Electric.....	324	( <sup>2</sup> )	( <sup>2</sup> )	1,683	181	100	9.5	1.6	0.8
Other.....				3	10	12	( <sup>2</sup> )	0.1	0.1
Electric motors.....	340	23	7	2,084	330	234	100.0	100.0	100.0
Run by current generated by establishments.....	22	23	7	401	158	134	10.2	46.6	57.3
Run by rented power.....	324	( <sup>2</sup> )	( <sup>2</sup> )	1,683	181	100	80.8	53.4	42.7

<sup>1</sup> Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.

<sup>2</sup> Not reported.

<sup>3</sup> Less than one-tenth of 1 per cent.

The table indicates that the increase in primary power was principally in power generated by steam. Electric power also shows a large increase, while water power shows a decrease. The more general

use of gas engines is shown, the number of such engines being 366 in 1909, as compared with 186 in 1904 and 158 in 1899. The number of motors run by rented power was not reported in 1904 and 1899, hence comparative figures are not available for the two earlier censuses. The horsepower furnished by electric motors run by rented power increased from 181 in 1904 to 1,683 in 1909. In 1904, 98.3 per cent of the total horsepower was owned by the establishments reporting, while in 1909 only 90.5 per cent was so reported. During the same period the proportion of rented electric horsepower increased from 1.6 per cent to 9.5 per cent. The horsepower developed by electric motors run by current generated in the manufacturing establishments reporting increased from 134 in 1899 to 158 in 1904 and 401 in 1909.

**Fuel.**—Closely related to the question of kind of power employed is that of the fuel used in generating this power, or otherwise as material in the manufacturing processes. Because a large amount of fuel is consumed in the manufacture of gas, it is included in addition to the five important industries in the following table, which shows the quantity of each kind of fuel used in 1909:

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gasoline (barrels).	Gas (1,000 feet).	Other (tons).
All industries.....	2,744	102,547	3,960	4,030	15,315	106,436	1
Bread and other bakery products.....	808	881	374	1,172	121	1,477	
Butter, cheese, and condensed milk.....	27	5,230			111	32	
Flour-mill and grist-mill products.....	522	26,702		9	1,681	100,000	
Gas, illuminating and heating.....	22	4,720	3,120		11,314		
Lumber and timber products.....		2,755			171	4	
Printing and publishing.....	632	1,400	23	318	960	2,241	
All other industries.....	733	69,700	434	2,531	957	2,682	

SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

(With statistics for laundries and custom saw and grist mills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and value of materials and products which do not appear on the general schedule. Certain data as to the products for three important industries of South Dakota are here presented.

Flour-mill and gristmill products.—Wheat is the principal agricultural crop of South Dakota, and naturally flour-mill and gristmill products ranked first among its manufactures. The following tabular statement gives the quantity and value of products for the last three census years:

PRODUCTS.	1909	1904	1899
<b>Products, total value.....</b>	<b>\$6,208,216</b>	<b>\$6,519,364</b>	<b>\$3,208,532</b>
Wheat flour:			
White—			
Barrels.....	962,840	1,142,805	897,020
Value.....	\$5,041,149	\$5,360,128	\$2,643,678
Graham—			
Barrels.....	5,446	5,219	(1)
Value.....	\$23,648	\$23,242	(1)
Corn meal and corn flour:			
Barrels.....	6,845	23,303	14,652
Value.....	\$23,413	\$49,571	\$23,480
Rye flour:			
Barrels.....	2,570	2,835	2,744
Value.....	\$12,022	\$11,414	\$6,651
Buckwheat flour:			
Pounds.....	219,675	20,000	(2)
Value.....	\$7,199	\$1,010	(2)
Barley meal:			
Pounds.....	361,000	40,000	347,000
Value.....	\$7,500	\$700	\$4,080
Feed:			
Tons.....	9,840	16,713	14,001
Value.....	\$245,786	\$286,438	\$185,130
Offal:			
Tons.....	44,272	55,845	33,868
Value.....	\$830,022	\$780,371	\$341,573
All other products, value.....	\$5,477	\$400	\$3,040

<sup>1</sup> Included in figures for white wheat flour.   <sup>2</sup> Figures not available.

There was a decrease in the value of products between 1904 and 1909, due to a falling off of 6 per cent in the value and of 15.7 per cent in the quantity of white flour manufactured. The figures for buckwheat flour and barley meal show notable increases for the same five-year period, the quantity of the former product increasing more than eightfold and of the latter product ninefold.

Butter.—The quantity and value of products for 1909, 1904, and 1899 are given in the table following.

The value of solid packed butter represented 90.3 per cent in 1909, 97 per cent in 1904, and 94.6 per cent in 1899 of the total value of products. From 1899 to 1904 this class of product decidedly increased both in quantity and in value, while from 1904 to 1909, notwithstanding a marked decrease in quantity, there was an increase in the value.

The quantity and value of skimmed milk sold shows

a very large decrease from census to census. This is due to the radical change which has taken place in the creamery industry. Formerly whole milk was brought to the creamery while at present the cream is largely separated on the farm and sold as such.

PRODUCTS.	1909	1904	1899
<b>Products, total value.....</b>	<b>\$2,085,511</b>	<b>\$2,182,053</b>	<b>\$1,199,493</b>
Butter:			
Packed solid—			
Pounds.....	8,880,010	10,835,596	6,110,726
Value.....	\$2,424,897	\$2,116,900	\$1,134,228
Prints and rolls—			
Pounds.....	615,598	222,864	61,881
Value.....	\$173,510	\$54,423	\$14,739
Cream sold:			
Pounds.....	390,108	2,140	1,596
Value.....	\$43,147	\$215	\$1,070
Skimmed milk:			
Pounds.....	1,116,882	4,491,814	9,690,340
Value.....	\$1,583	\$7,903	\$8,670
All other products, value.....	\$42,368	\$13,212	\$40,786

Does not include 1 cheese establishment.

Printing and publishing.—The progress of the newspaper and periodical branch of the industry is indicated in the following statement, which shows the number and aggregate circulation per issue for the different classes of publications for the years 1909, 1904, and 1899:

PERIOD OF ISSUE.	NUMBER OF PUBLICATIONS.			AGGREGATE CIRCULATION PER ISSUE.		
	1909	1904	1899	1909	1904	1899
<b>Total.....</b>	<b>402</b>	<b>302</b>	<b>221</b>	<b>485,101</b>	<b>380,705</b>	<b>232,166</b>
Daily.....	19	16	10	40,153	21,910	16,403
Sunday.....	4	5	3	23,526	11,350	(1)
Semiweekly.....	3	5	1	4,400	6,850	1,600
Weekly.....	360	263	189	277,127	198,604	151,488
Monthly.....	11	11	9	23,750	58,600	34,400
All other classes.....	5	2	3	110,145	33,391	25,265

<sup>1</sup> Included in circulation for dailies.

In 1909 the aggregate circulation per issue of the newspapers and periodicals of the state was 485,101, which represents an increase of 46.7 per cent over the corresponding figure for 1904. Weekly publications have a greater circulation than all other periodicals combined; out of a total of 402 newspapers and periodicals published in 1909, 360, or 89.6 per cent, were published weekly. The proportion which the weeklies formed of the total number in 1904 was 87.1 per cent, while in 1899 it was 85.5 per cent. There was an increase of three in the number of dailies from 1904 to 1909, but during the same period the combined average circulation of all dailies increased over 100 per cent.

Laundries.—Statistics for steam laundries are not included in the general tables. In 1909 there were 28 such establishments in the state of South Dakota, 4 of which were located in Aberdeen and 3 in Sioux Falls. The following statement summarizes the statistics:

Number of establishments.....	28
Persons engaged in the industry.....	447
Proprietors and firm members.....	33
Salaried employees.....	28
Wage earners (average number).....	386
Primary horsepower.....	519
Capital.....	\$336,276
Expenses.....	313,492
Services.....	190,830
Materials.....	81,770
Miscellaneous.....	40,892
Amount received for work done.....	423,092

Sixteen establishments were operated by individuals, 4 by corporations, and 8 by general partnerships. Nine establishments had receipts for the year's business of less than \$5,000; 9, receipts of \$5,000 but less than \$20,000; and 10, receipts of \$20,000 but less than \$100,000.

The number of wage earners employed each month and the per cent which this number represented of the greatest number employed in any month were as follows:

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	352	85.0	July.....	410	99.0
February.....	352	85.0	August.....	414	100.0
March.....	356	86.0	September.....	406	98.1
April.....	369	89.1	October.....	393	96.1
May.....	384	92.8	November.....	395	95.4
June.....	394	95.2	December.....	397	95.9

The different kinds of primary power, the number of engines, and the amount of horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines.	Horsepower.
<b>Primary power, total.....</b>		<b>519</b>
Owned.....	26	396
Steam engines.....	19	360
Gas engines.....	7	36
Rented—Electric.....	23	123

The kind and amount of fuel used are shown in the following tabular statement:

KIND.	Unit.	Quantity.
Anthracite coal.....	Tons.....	19
Bituminous coal.....	Tons.....	6,265
Wood.....	Cords.....	1
Oil.....	Barrels.....	216
Gas.....	1,000 feet.....	5,236

Custom saw and grist mills.<sup>1</sup>—Statistics for custom saw and grist mills are not included in the general tables, but are presented in the following summary:

Number of establishments.....	4
Persons engaged in the industry.....	4
Proprietors and firm members.....	3
Wage earners (average number).....	1
Primary horsepower.....	82
Capital.....	\$15,500
Expenses.....	29,637
Services.....	400
Materials.....	28,630
Miscellaneous.....	607
Value of products.....	36,102

<sup>1</sup> Includes one custom sawmill.

<sup>2</sup> Includes estimated cost of grain ground.

STATISTICS OF MANUFACTURES—SOUTH DAKOTA.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.

THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employees.	Wage earners (average number).							
<b>STATE—All Industries.....</b>	1909	1,020	5,226	942	682	3,602	17,666	\$13,018	\$616	\$2,298	\$11,476	\$17,870	\$6,394
	1904	686	3,532	649	441	2,492	11,154	7,585	284	1,422	8,697	13,085	4,888
	1899	624	( <sup>1</sup> )	( <sup>1</sup> )	288	2,224	11,775	6,051	175	1,130	6,484	9,530	3,046
Artificial stone.....	1909	38	168	40	15	104	130	190	10	02	120	253	133
	1904	4	40	2	0	35	20	37	4	18	27	63	30
	1899												
Bread and other bakery products.....	1909	92	431	114	31	283	120	500	30	151	721	1,101	440
	1904	32	109	41	12	118	81	170	7	49	218	388	170
	1899	13	51	17	8	26	( <sup>1</sup> )	23	2	14	20	79	50
Brick and tile.....	1909	12	72	5	13	54	700	227	10	28	31	103	72
	1904	10	64	9	6	49	355	175	3	27	20	84	64
	1899	11	67	19		48	192	64		20	13	49	33
Butter, cheese, and condensed milk.....	1909	95	252	50	63	130	1,450	633	44	112	2,308	2,086	378
	1904	97	350	32	126	192	1,410	484	26	125	1,833	2,133	350
	1899	138	287	44	95	148	1,570	461	12	77	1,005	1,100	194
Carriages and wagons and materials.....	1909	10	64	10	0	48	04	133	4	38	60	131	71
	1904	3	23	2	2	19	10	54	2	13	10	31	21
	1899	9	( <sup>1</sup> )	( <sup>1</sup> )		25	41	44		14	20	49	20
Cars and general shop construction and repairs by steam-railroad companies.....	1909	5	346		10	327	557	250	23	243	165	439	274
	1904	0	197		13	184	270	107	15	106	131	251	120
	1899	7	126		9	117	70	68	8	80	87	173	91
Confectionery.....	1909	3	136		30	106	60	203	38	36	271	400	129
	1904	5	121	3	21	97	15	182	20	35	101	332	141
	1899	( <sup>2</sup> )											
Flour-mill and gristmill products.....	1909	95	454	83	80	285	7,364	2,873	70	187	5,330	6,208	872
	1904	96	521	110	64	347	6,777	2,428	57	203	5,358	6,519	1,161
	1899	86	( <sup>1</sup> )	( <sup>1</sup> )	52	275	( <sup>1</sup> )	1,047	47	148	2,685	3,209	524
Foundry and machine-shop products.....	1909	37	137	45	14	78	307	352	8	62	73	225	152
	1904	11	138	12	3	123	269	188	6	124	54	221	107
	1899	13	38	18	1	19	( <sup>1</sup> )	42	( <sup>2</sup> )	8	14	39	25
Gas, illuminating and heating.....	1909	17	144		36	108	318	1,317	26	64	120	278	168
	1904	7	61		14	47	115	654	9	20	48	143	100
	1899	( <sup>3</sup> )											
Liquors, malt.....	1909	4	103		27	76	796	1,330	42	59	231	606	375
	1904	4	87		17	70	267	930	24	44	149	388	230
	1899	4	74	3	10	61	218	561	12	24	38	280	242
Lumber and timber products.....	1909	58	534	52	31	451	2,260	941	33	301	349	945	596
	1904	26	227	23	13	191	833	244	13	114	97	377	280
	1899	30	418	( <sup>1</sup> )	17	371	( <sup>1</sup> )	233	15	170	192	495	303
Marble and stone work.....	1909	15	148	18	14	116	213	132	13	76	73	220	147
	1904	5	33	6	3	24	41	69	2	20	46	97	51
	1899	7	( <sup>1</sup> )	( <sup>1</sup> )	2	125	( <sup>1</sup> )	58	2	45	10	114	104
Printing and publishing.....	1909	302	1,387	350	203	825	931	2,159	170	493	456	1,076	1,520
	1904	270	1,001	301	108	592	428	1,344	35	312	242	1,222	980
	1899	209	770	224	62	494	( <sup>1</sup> )	737	37	204	161	746	585
Tobacco manufactures.....	1909	59	287	72	12	203		216	12	122	104	454	230
	1904	47	227	55	5	167		125	5	87	127	328	201
	1899	27	168	30	0	120		84	5	60	60	197	128
All other industries.....	1909	88	563	85	82	396	2,246	1,553	74	264	998	1,785	787
	1904	54	317	53	25	239	259	304	17	119	140	453	307
	1899	64	( <sup>1</sup> )	( <sup>1</sup> )	33	380	( <sup>1</sup> )	2,029	35	266	2,161	2,899	738

CITIES OF ABERDEEN AND SIOUX FALLS—ALL INDUSTRIES COMBINED.

<b>ABERDEEN.....</b>	1909	37	430	36	99	295	540	\$1,132	\$94	\$178	\$1,011	\$1,575	\$564
<b>SIOUX FALLS.....</b>	1909	83	937	86	174	677	1,402	2,805	161	385	1,629	2,889	1,260
	1904	61	633	67	101	465	( <sup>1</sup> )	1,748	98	248	1,066	1,898	832
	1899	48	( <sup>1</sup> )	( <sup>1</sup> )	67	311	( <sup>1</sup> )	927	42	162	322	884	562

<sup>1</sup> Figures not available.

<sup>2</sup> Does not include statistics for one establishment, to avoid disclosure of individual operations.

<sup>3</sup> Figures can not be shown without disclosing individual operations.

<sup>4</sup> Does not include statistics for two establishments, to avoid disclosure of individual operations.

<sup>5</sup> Less than \$500.

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.				Primary horsepower.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners.			Total.	16 and over.		Under 16.			
					Male.	Female.	Average number.	Number.			Male.	Female.	Male.	Female.		
								Maximum month.	Minimum month.							
1 All industries .....	1,020	5,226	942	285	255	142	3,602	Se 3,925	Ja 3,108	170	170			17,668		
2 Artificial stone .....	38	168	49	11	3	1	104	Je <sup>1</sup> 106	Ja 24	170	170			120		
3 Bread and other bakery products .....	92	431	114	4	13	14	286	Au 325	Mh 259	278	183	91	4	120		
4 Brick and tile .....	12	72	5	1	2		64	Je 106	Ja <sup>1</sup> 8	103	103			700		
5 Brooms .....	5	23	5		1	1	18	Ja <sup>2</sup> 16	Au <sup>2</sup> 10	16	10			2		
6 Butter, cheese, and condensed milk .....	95	252	50	31	18	14	139	Jy 170	Fe <sup>1</sup> 110	131	125	6		1,450		
7 Carriages and wagons and materials .....	10	54	10	3	2	1	48	De 60	Fe <sup>1</sup> 42	69	60			94		
8 Cars and general shop construction and repairs by steam-railroad companies .....	5	346		12	7		327	De 398	My 209	398	398			57		
9 Confectionery .....	3	136		7	18	5	106	No 130	Jy 89	121	46	75		60		
10 Copper, tin, and sheet-iron products .....	8	33	7	2	3	1	20	Jy <sup>1</sup> 25	Ja 15	19	17			8		
11 Flour-mill and gristmill products .....	95	454	83	54	22	10	285	No 320	My 253	323	322		2	7,364		
12 Foundry and machine-shop products .....	37	137	45	7	6	1	78	Jy 89	Ja 65	91	91			307		
13 Fur goods .....	3	15	3			2	10	No <sup>1</sup> 17	My <sup>1</sup> 5	17	3	14		1		
14 Gas, illuminating and heating .....	17	144		17	9	10	108	Jy 160	Fe <sup>1</sup> 78	102	102			308		
15 Jewelry .....	3	11	4	1			6	De <sup>1</sup> 7	My 5	6	5	1		5		
16 Leather goods .....	3	9	3	2			4	Fe <sup>1</sup> 0	Ja <sup>1</sup> 4	4	4					
17 Lime .....	6	29	3	1	1		24	No 42	Fe <sup>1</sup> 18	38	38					
18 Liquors, malt .....	4	103		16	10	1	76	Au 88	No 69	72	69		3	700		
19 Lumber and timber products .....	58	534	52	18	10	3	451	No 562	Ja 331	608	606		2	2,200		
20 Marble and stone work .....	15	148	18	4	9	1	116	Je 145	Fe 60	133	132		1	210		
21 Patent medicines and compounds and druggists' preparations .....	3	4		2			2	Ja <sup>2</sup> 2	Au <sup>2</sup> 2	2	1	1				
22 Printing and publishing .....	392	1,387	359	58	84	61	825	De 858	Ja 704	878	609	246	23	931		
23 Tobacco manufactures .....	59	287	72	3	9		203	De 227	Ap 185	232	187	35	10			
24 All other industries .....	57	439	60	21	28	16	314							2,231		

<sup>1</sup> Same number reported for one or more other months.

<sup>2</sup> Same number reported throughout the year.

<sup>3</sup> All other industries embrace—

Agricultural implements .....	3	Flavoring extracts .....	1	Photo-engraving .....	1
Automobiles, including bodies and parts .....	3	Furnishing goods, men's .....	1	Shipbuilding, including boat building .....	1
Awnings, tents, and sails .....	2	Furniture and refrigerators .....	2	Slaughtering and meat packing .....	1
Carpets, rag .....	2	Grease and tallow .....	1	Stoves and furnaces, including gas and oil stoves .....	1
Cars and general shop construction and repairs by street-railroad companies .....	1	Leather, tanned, curried, and finished .....	1	Type founding and printing materials .....	1
Cement .....	1	Mattresses and spring beds .....	2	Typewriters and supplies .....	1
Clothing, men's, including shirts .....	2	Mineral and soft waters .....	25	Wall plaster .....	1
Coffee and spice, roasting and grinding .....	1	Models and patterns, not including paper patterns .....	1		
		Paint and varnish .....	1		

STATISTICS OF MANUFACTURES—SOUTH DAKOTA.

THE STATE, BY INDUSTRIES: 1909.

	Capital.	EXPENSES.										Value of products.	Value added by manufacture.
		Total.	Services.			Materials.		Miscellaneous.					
			Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.		
1	\$13,017,932	\$16,787,191	\$324,561	\$291,060	\$2,297,512	\$507,855	\$10,968,495	\$93,868	\$145,837	\$196,243	\$961,760	\$17,870,135	\$6,393,785
2	190,472	199,327	7,690	2,060	61,644	2,715	117,354	330	1,111	963	5,460	253,407	133,335
3	500,429	986,951	7,200	22,576	151,404	28,204	693,162	19,639	4,180	-----	60,586	1,160,536	430,170
4	226,870	79,632	8,855	720	27,504	19,838	10,736	5	1,126	-----	10,842	102,660	72,086
5	21,445	25,622	-----	1,420	8,340	306	12,003	-----	82	-----	3,462	33,404	21,065
6	633,230	2,545,073	22,154	21,760	111,770	33,097	2,274,036	5,339	3,033	-----	72,984	2,085,511	377,478
7	133,121	108,348	2,900	1,380	37,952	3,824	56,499	70	1,215	13	4,495	131,384	71,061
8	258,972	438,921	18,070	5,210	243,499	20,030	145,018	-----	1,075	-----	6,019	438,919	273,871
9	203,204	375,659	14,560	23,671	35,714	4,790	266,497	1,804	765	-----	27,808	400,240	128,962
10	40,543	88,130	3,600	2,979	13,899	560	48,406	1,688	179	-----	16,813	107,048	58,676
11	2,872,621	5,854,359	58,147	21,044	187,206	110,320	5,219,445	979	17,451	6,054	227,653	6,208,216	872,451
12	352,214	156,233	5,434	2,270	62,386	8,724	64,277	694	2,120	285	10,043	225,471	162,470
13	42,900	30,206	-----	936	4,966	175	19,610	1,200	133	-----	3,186	42,737	22,952
14	1,317,421	230,914	15,418	10,106	63,716	78,357	41,166	-----	5,776	-----	25,345	277,669	158,016
15	13,231	14,305	200	-----	6,279	92	6,986	504	100	-----	144	17,001	10,523
16	12,400	12,700	600	-----	3,483	42	7,650	620	100	-----	205	17,780	10,097
17	34,900	36,234	300	90	14,742	8,367	12,558	-----	57	-----	130	38,510	17,595
18	1,330,410	461,208	28,300	13,791	58,798	25,003	205,358	-----	61,108	-----	78,070	605,999	374,948
19	940,540	894,682	22,240	10,395	300,940	13,406	335,445	1,021	7,049	152,168	52,009	944,777	595,860
20	132,045	178,907	4,488	8,985	75,942	3,413	69,257	3,624	774	600	11,884	219,868	147,108
21	5,250	8,803	1,500	-----	1,500	-----	3,980	740	100	357	626	12,033	8,053
22	2,159,079	1,385,567	69,451	100,074	493,317	41,755	414,739	38,799	12,137	21,070	193,625	1,975,976	1,519,482
23	216,861	359,682	3,540	8,340	121,858	1,901	101,869	7,871	31,716	-----	22,597	454,281	290,521
24	1,371,756	1,306,548	29,905	33,247	210,584	96,180	781,524	8,941	4,310	14,163	127,654	1,515,590	637,876

## MANUFACTURES : TENNESSEE

## STATISTICS OF MANUFACTURES FOR THE STATE, CITIES, AND INDUSTRIES

Prepared under the supervision of W. M. STEUART, Chief Statistician for Manufactures

## INTRODUCTION.

This advance bulletin gives the statistics of manufactures for the state of Tennessee for the calendar year 1909 as shown by the Thirteenth Census. It will be reprinted without change as a part of the Compendium of the Census for Tennessee and in the final reports of the Thirteenth Census.

The text summarizes the general results of the census inquiry, presenting a series of special tables in which the main facts printed in the general tables are given in convenient form for the state as a whole and for important industries. It also presents tables in which the statistics for the industries of the state as a whole and for a few important industries are classified by character of ownership, size of establishments, number of wage earners, and prevailing hours of labor, information which could not be presented in general tables for each industry without disclosing the facts for individual establishments.

At the end of the bulletin are two general tables.

Table I gives for 1909, 1904, and 1899 the number of establishments and of persons engaged in the industries, primary power, capital, salaries and wages, cost of materials, value of products, and value added by manufacture reported for all industries combined and for certain important industries (1) for the state as a whole and (2) for the cities of Memphis and Nashville. It also gives the same items for all industries combined for every city and town having in 1910 a population of over 10,000 but less than 50,000.

Table II gives statistics in detail for 1909 for the state and for a larger number of industries.

**Scope of census: Factory industries.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of organization, location of establishments, size of establishments, labor force, and similar subjects. When use is made of the data for these purposes, it is imperative that due attention should be given to the limitations of the figures. Particularly is this true when the attempt is made to derive from them figures purporting to show average wages, cost of production, or profits. These limitations will be fully discussed in the general report on manufactures for the United States as a whole. It is impossible to reproduce such discussion in the bulletins relative to the individual states.

The census of 1909, like that of 1904, was confined to manufacturing establishments conducted under the factory system, as distinguished from the neighborhood, hand, and building industries. Where statistics for 1899 are given they have been reduced to a

comparable basis by eliminating the latter classes of industries. The census does not include establishments which were idle during the entire year, or had a value of products of less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions, or in governmental establishments, except those of the Federal Government.

**Period covered.**—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—The term "establishment" comprises the factories, mills, or plants which are under a common ownership or control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment as thus defined were not all located within the same city or state, separate reports were secured in order that the separate totals might be included in the statistics for each city or state. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products very different from those covered by the class designation, and, on the other hand, may not include the total product covered by this designation, because some part of this product may be made in establishments in which it is not the product of chief value.

**Selected industries.**—The general tables at the end of this bulletin give the principal facts separately for the industries of the state. A selection has been made of the leading industries of the state for more detailed consideration. Sometimes an industry of greater importance than some of those selected is omitted because it comprises so few establishments that these detailed presentations would reveal the operations of individual concerns.

**Comparisons with previous censuses.**—Owing to the changes in industrial conditions it is not always possible to classify establishments by industries in such a way as to permit accurate comparison with preceding censuses. Table I, giving comparable figures for 1909, 1904, and 1899, therefore, does not embrace all the industries shown for 1909 in Table II.

**Influence of increased prices.**—In considering changes in cost of materials, value of products, and value added by manufacture, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures can not be taken as an exact measure of increase in the volume of business.

**Persons engaged in industry.**—At the censuses of 1909, 1904, and 1899 the following general classes of persons engaged in manufacturing industries have been distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks, and (5) wage earners. In the censuses of 1904 and 1899 these five classes were shown according to the three main groups: (1) Proprietors and firm members, (2) salaried officials, clerks, etc., and (3) wage earners. The second group included the three classes of salaried officers of corporations, superintendents and

managers, and clerks. In the present census an entirely different grouping is employed: That in to (1) proprietors and officials, (2) clerks, and (3) wage earners. The first group includes proprietors and firm members, salaried officers of corporations, and superintendents and managers.

At this census the number of persons engaged in the industries, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for December 15, or the nearest representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where conditions were exceptional, and particularly in the case of certain seasonal industries, such as canning, the December date could not be accepted as typical, and an earlier date had to be chosen.

In the case of employees other than wage earners the number thus reported on December 15, or other representative day, has been treated as equivalent to the average for the year, since the number of employees of this class does not vary much from month to month in a given industry. In the case of wage earners the average is obtained in the manner explained in the next paragraph.

**Wage earners.**—In addition to the report by sex and age of the number of wage earners on December 15, or other representative day, a report was obtained of the number employed on the 15th of each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because in view of the variations of date such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In particular, totals by sex and age for the wage earners reported for the representative day would be misleading because of the undue weight given to seasonal industries, in some of which, such as canning and preserving, the distribution of the wage earners by sex and age is materially different from that in most industries of more regular operation. In order to determine as nearly as possible the sex and age distribution of the average number of wage earners in the state as a whole, the following procedure has been adopted:

The percentage distribution by sex and age of the wage earners in each industry, for December 15, or the nearest representative day, has been calculated from the actual numbers reported for that date. This percentage has been applied to the average number of wage earners for the year in that industry, to determine the average number of men, women, and children employed. These calculated averages for the several industries have been added up to give the average distribution for the state as a whole.

In 1899 and 1904 the schedule called for the average number of wage earners of each sex 16 years and over, and the total number under 16 years of age, for each month, and these monthly statements were combined in an annual average. Comparatively few manufacturing concerns, however, keep their books in such way as to show readily the number of men, women, and children (under 16) employed each month. These monthly returns by sex and age were, in fact, largely estimates. It was believed that a more accurate and reliable sex and age distribution could be secured by taking as a basis of estimate the actual numbers employed on a single day.

**Prevailing hours of labor.**—The census made no attempt to ascertain the number of employees working a given number of hours

per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and no attention is given to the fact that a limited number of employees may have hours differing from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

**Capital.**—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

**Materials.**—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term materials includes fuel, rent of power and heat, mill supplies, and containers, as well as materials forming a constituent part of the product. Fuel includes all fuel used, whether for heat, light, or power, or for the process of manufacture.

**Expenses.**—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness, and allowances for depreciation.

**Value of products.**—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

**Value added by manufacture.**—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishments. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "value added by manufacture."

**Cost of manufacture and profits.**—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products, the rate of profit on the investment could not properly be calculated, because of the very defective character of the returns regarding capital.

**Primary power.**—The figures given for this item show the total of the primary power used by the establishments. They do not cover the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

**Location of establishments.**—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the fact that often establishments are located just outside the boundaries of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

**Laundries.**—The census of 1909 was the first to include statistics

of laundries. The reports are confined to establishments using mechanical power. The data are presented separately and are not included in the general total for manufacturing industries, in order to avoid interference with comparisons with prior censuses.

**Custom sawmills and gristmills.**—In order to make the statistics for 1909 comparable with those for 1904 the data for these mills have been excluded from all the tables presenting general statistics, and are given in a separate table at the end of this report.

**INDUSTRIES IN GENERAL.**

**General character of the state.**—Tennessee has a gross area of 42,022 square miles, of which 335 represent water surface. Its population in 1910 was 2,184,789, as compared with 2,020,616 in 1900 and 1,767,518 in 1890. It ranked seventeenth among the 49 states and territories of continental United States as regards population in 1910 and fourteenth in 1900. The density of population for the entire state is 52.4 per square mile, the corresponding figure for 1900 being 48.5. Of the entire population of the state, 20.2 per cent resided in cities and incorporated towns having a population of 2,500 inhabitants or over, as against 16.2 per cent in 1900.

Memphis, with a population of 131,105, and Nashville with 110,364, are the only cities in the state having over 50,000 inhabitants in 1910. Three other cities have a population of over 10,000 but less than 50,000, namely, Chattanooga, Knoxville, and Jackson. Apart from these five cities, only 4.7 per cent of the population resided in cities and incorporated towns of 2,500 inhabitants or over.

The transportation facilities of the state are good, as the Mississippi, Tennessee, and Cumberland Rivers afford advantages for communication by water, while the trunk lines of a number of large railway systems, several of which center at Memphis, cross the state

and afford direct connection with all parts of the country.

**Importance and growth of manufactures.**—Tennessee is preeminently an agricultural and mining state, and its manufactures are based largely upon its rich natural resources. The development of manufacturing in the state has about kept pace with that in the United States as a whole, the value of the manufactures of the state representing about the same relative proportion, less than 1 per cent, of the total value of products of the manufacturing industries of the United States in 1849-50 and in 1909.

In 1849 the total value of the manufactures of the state, including the products of the neighborhood and hand industries, amounted to only \$9,725,608, while in 1909, exclusive of the value of products of the neighborhood and hand industries, it reached \$180,216,548, an increase of over seventeen times in 60 years. During the same period the population of the state increased 117.9 per cent. The gross value of products per capita of the total population of the state increased from \$10 in 1849 to \$82 in 1909.

The following table gives the most important figures relative to all classes of manufactures combined for 1909, 1904, and 1899, together with the percentages of increase from census to census:

	NUMBER OR AMOUNT.			PER CENT OF INCREASE.	
	1900	1904	1899	1904-1900	1899-1904
Number of establishments.....	4,609	3,175	3,116	45.2	1.9
Persons engaged in manufactures.....	87,672	69,287	(1)	26.5	(1)
Proprietors and firm members.....	5,415	3,805	(1)	42.3	(1)
Salaried employees.....	8,417	4,910	3,329	71.4	47.5
Wage earners (average number).....	73,840	60,572	45,963	21.9	31.8
Primary horsepower.....	242,277	175,780	130,318	37.8	34.9
Capital.....	\$167,924,000	\$102,439,000	\$63,141,000	63.9	62.2
Expenses.....	158,980,000	119,328,000	78,358,000	33.2	52.3
Services.....	37,438,000	27,886,000	17,776,000	34.3	56.9
Salaries.....	9,136,000	5,080,000	3,048,000	80.8	66.7
Wages.....	28,252,000	22,806,000	14,728,000	23.9	54.8
Materials.....	104,016,000	79,352,000	54,559,000	31.1	45.4
Miscellaneous.....	17,526,000	12,090,000	6,023,000	45.0	100.7
Value of products.....	180,217,000	137,960,000	92,749,000	30.6	48.7
Value added by manufacture (value of products less cost of materials).....	76,201,000	58,608,000	38,190,000	30.0	53.5

<sup>1</sup> Figures not available.

In 1909 the state of Tennessee had 4,609 manufacturing establishments, which gave employment to an average of 87,672 persons during the year and paid out \$37,438,000 in salaries and wages. Of the persons employed, 73,840 were wage earners. These establishments turned out products to the value of

\$180,217,000, to produce which materials costing \$104,016,000 were used. The value added by manufacture was thus \$76,201,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year.

## MANUFACTURES—TENNESSEE.

In general, this table indicates that while there was considerable development in manufactures during the five-year period 1904-1909, the percentage of increase in most items was less than for the preceding five-year period, 1899-1904. The greatest relative increases during the later period were in number of establishments (45.2 per cent), number of salaried employees (71.4 per cent), and salaries (80.8 per cent). The number of wage earners increased 21.9 per cent, the value of products 30.6 per cent, and value added by

manufacture 30 per cent. As pointed out in the Introduction, it would be improper to infer that manufactures increased in volume to the full extent indicated by these figures regarding values, since the increase shown is certainly due in part to the increase that has taken place in the price of commodities.

The relative importance and growth of the leading manufacturing industries of the state are shown in the following table:

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.		PER CENT OF INCREASE. <sup>1</sup>			
		Average number.	Per cent distribution.	Amount.	Per cent distribution.	Amount.	Per cent distribution.	Value of products.		Value added by manufacture.	
								1904-1909	1899-1904	1904-1909	1899-1904
All industries.....	4,609	73,840	100.0	\$180,217,000	100.0	\$76,201,000	100.0	30.6	48.7	30.0	53.5
Lumber and timber products.....	1,977	22,389	30.3	30,457,000	16.9	16,816,000	22.1	13.4	40.2	10.1	55.2
Flour-mill and gristmill products.....	454	1,577	2.1	29,070,000	16.1	3,784,000	5.0	14.7	32.3	10.0	21.2
Foundry and machine-shop products.....	124	4,041	5.5	9,190,000	5.1	4,030,000	5.1	50.1	31.0	41.6	38.6
Printing and publishing.....	413	2,914	3.9	7,173,000	4.0	5,219,000	6.8	40.9	47.4	38.5	46.4
Cars and general shop construction and repairs by steam-railroad companies.....	17	5,500	7.5	6,777,000	3.8	3,601,000	4.8	16.1	87.6	28.0	80.5
Oil, cottonseed, and cake.....	20	806	1.1	6,593,000	3.7	1,392,000	1.8	76.1	25.0	110.9	-6.0
Cotton goods, including cotton small wares.....	17	3,078	4.2	5,201,000	2.9	1,867,000	2.4	46.1	78.5	40.7	54.9
Iron and steel, blast furnaces.....	13	1,143	1.5	4,653,000	2.6	1,272,000	1.7	35.7	-27.0	55.3	-40.3
Hosiery and knit goods.....	22	3,117	4.2	3,595,000	2.0	1,445,000	1.9	119.0	312.2	119.3	351.4
Patent medicines and compounds and druggists' preparations.....	76	433	0.6	3,515,000	2.0	2,174,000	2.9				
Clothing, men's, including shirts.....	34	1,506	2.2	3,361,000	1.9	1,238,000	1.6	9.5	74.4	3.9	60.2
Furniture and refrigerators.....	42	2,419	3.3	3,300,000	1.8	1,801,000	2.4				
Fertilizers.....	12	559	0.8	3,249,000	1.8	1,127,000	1.5	20.3	84.2	14.0	48.3
Carriages and wagons and materials.....	129	1,706	2.3	3,040,000	1.7	1,601,000	2.1	-7.3	93.7	-0.6	76.5
Bread and other bakery products.....	131	855	1.2	2,592,000	1.6	1,102,000	1.4	46.5	70.0	15.6	126.0
Leather, tanned, curried, and finished.....	25	395	0.5	2,530,000	1.4	530,000	0.7	-20.4	27.9	-26.0	18.6
Confectionery.....	31	894	1.2	2,520,000	1.4	893,000	1.1	34.5	130.1	-5.4	133.8
Liquors, distilled.....	30	154	0.2	2,256,000	1.3	1,301,000	2.4	297.2	-30.6	406.5	-67.8
Leather goods.....	47	604	0.8	2,139,000	1.2	826,000	1.1	10.7	59.3	0.0	75.1
Slaughtering and meat packing.....	27	280	0.4	2,057,000	1.1	447,000	0.6				
Liquors, malt.....	5	302	0.5	2,044,000	1.1	1,391,000	1.8	11.0	55.9	-0.3	52.8
Stoves and furnaces, including gas and oil stoves.....	17	1,685	1.5	1,951,000	1.1	1,234,000	1.6	74.8		60.9	
Woolen, worsted, and felt goods, and wool hats.....	21	1,654	2.2	1,802,000	1.0	675,000	0.9	5.0	12.5	-11.3	18.4
Marble and stone work.....	81	1,066	1.4	1,465,000	0.8	985,000	1.3	55.2	11.7	62.8	-4.0
Ice, manufactured.....	57	779	1.1	1,324,000	0.7	1,043,000	1.4	93.6	27.1	85.9	31.1
Brick and tile.....	91	1,281	1.7	1,308,000	0.7	962,000	1.3	18.9	60.0	15.2	60.9
Gas, illuminating and heating.....	11	422	0.6	1,282,000	0.7	925,000	1.2	54.5	45.1	47.8	43.2
Copper, tin, and sheet-iron products.....	57	572	0.8	1,229,000	0.7	636,000	0.8	41.1	147.4	45.9	123.6
Coffins, burial cases, and undertakers' goods.....	8	480	0.6	1,189,000	0.7	667,000	0.9	28.8	47.7	10.2	93.9
Boots and shoes, including cut stock and findings.....	4	374	0.5	1,181,000	0.6	354,000	0.5	41.1		70.7	
Cooperage and wooden goods, not elsewhere specified.....	19	856	1.2	1,148,000	0.6	519,000	0.7				
Agricultural implements.....	16	645	0.9	1,004,000	0.6	591,000	0.8	30.6	60.1	23.9	74.3
Mattresses and spring beds.....	17	272	0.4	666,000	0.4	294,000	0.4	50.5	65.8	33.0	168.3
Coke.....	8	250	0.3	586,000	0.3	108,000	0.1	-27.7	5.9	-45.7	-17.8
Paint and varnish.....	6	71	0.1	397,000	0.2	159,000	0.2	-17.5	218.5	-17.0	211.3
Pottery, terra-cotta, and fire-clay products.....	6	323	0.4	328,000	0.2	218,000	0.3	6.1	18.8	-5.2	23.7
Lime.....	20	415	0.6	323,000	0.2	230,000	0.3	-0.9		12.2	
Boxes, fancy and paper.....	6	202	0.3	258,000	0.1	136,000	0.2	31.6	48.5	47.8	33.3
Canning and preserving.....	37	303	0.4	206,000	0.1	75,000	0.1	-14.9	230.1	-17.0	167.6
Millinery and lace goods.....	6	92	0.1	202,000	0.1	101,000	0.1	11.6		26.2	
All other industries.....	466	7,840	10.6	26,787,000	14.9	11,186,000	14.7				

<sup>1</sup> Per cent of increase is based on figures in Table I, and a minus sign (-) denotes a decrease. Where percentages are omitted, the figures are not comparable.

It should be borne in mind in considering this table that the value of products in some of the industries involves a certain amount of duplication, due to the use of the products of one establishment in the industry as material for another establishment.

In addition to the 40 industries presented separately in the above table, there are 19 other industries, each of which reported products valued at more than \$200,000 in 1909. These are included under the head of "All other industries," because in some in-

stances, if they were shown separately, the operations of individual establishments would be disclosed; in others, because the returns do not properly present the true conditions of the industry, as it is more or less interwoven with one or more other industries; and in others because comparable statistics for the different census years can not be presented on account of changes in classification. These industries are: Bags, other than paper; brooms; cars and general shop construction and repairs by street-railroad com-

panies; cars, steam-railroad, not including the operations of railroad companies; cement; coffee and spice, roasting and grinding; dyestuffs and extracts; explosives; flavoring extracts; food preparations; glass; iron and steel, steel works and rolling mills; mineral and soda waters; smelting and refining, copper; soap; sulphuric, nitric, and mixed acids; tobacco manufactures; vinegar and cider; and wood, turned and carved. Statistics, however, for the manufacture of bags, other than paper, the broom industry, street-railroad repair shops, and the construction of steam-railroad cars are presented in Table II, page 22, for 1909.

The most important industries listed in this table, in which they are arranged in the order of the value of products, call for brief consideration.

*Lumber and timber products.*—This industry embraces logging operations, sawmills, planing mills, and establishments engaged in the manufacture of wooden packing boxes. The statistics of mills engaged exclusively in custom sawing for local consumption are not included in the general tables or in the totals for manufacturing industries. Separate statistics for the custom sawmills are given on page 17. In spite of the fact that the rate of increase in this industry was comparatively small for the period from 1904 to 1909, it still leads all other industries in the state, having in 1909 over two-fifths of the number of establishments and reporting over one-sixth of the total value of products and nearly one-third of the total number of wage earners.

*Flour-mill and gristmill products.*—In value of products this industry stood but little below the lumber and timber products industry in 1909, reporting 16.1 per cent of the total for the state. The rate of growth, however, was less from 1904 to 1909 than from 1899 to 1904. There was a slight decrease during the last five years in the number of wage earners employed, due perhaps to improved methods of manufacturing and of handling grain and the manufactured products. The soil and climatic conditions of the state are well adapted, especially in the eastern and middle sections, to the raising of wheat and corn. Owing to the comparatively simple processes involved in this class of manufacture, as well as the extent to which these processes are carried on by machinery, the value added by manufacture and the number of wage earners employed are small in proportion to the gross value of products.

*Foundry and machine-shop products.*—This classification embraces not only foundries and machine shops but establishments engaged in the manufacture of gas machines, hardware, plumbers' supplies, steam fitting and heating apparatus, iron and steel pipe, cast, and structural ironwork. The industry was really of greater importance in the state than is indicated by the statistics, as some machine shops manufactured a distinctive product and were assigned to other clas-

sifications. The number of establishments engaged in the industry increased from 100 in 1904 to 124 in 1909. During this period the value of products increased 50.1 per cent and the value added by manufacture 41.6 per cent.

*Printing and publishing.*—All establishments engaged in bookbinding and blank-book making, steel engraving and plate printing, job printing, and the printing and publishing of newspapers, periodicals, books, and music are included under this head. This industry has had a substantial growth during each of the two five-year periods.

*Cars and general shop construction and repairs by steam-railroad companies.*—This industry is peculiar among the manufacturing industries of the country. It represents the work done in the car shops of steam-railroad companies and is practically confined to the repairs to the rolling stock and equipment of their own roads, although, to a limited extent, there may be some new construction of rolling stock. The statistics are exclusive of minor repairs in roundhouses.

*Oil, cottonseed, and cake.*—The statistics include those for all establishments engaged primarily in extracting oil from cotton seed or refining crude cottonseed oil. The industry is entirely dependent upon the production of cotton, as it utilizes the seed, of which, prior to 1870, comparatively little use was made. In this industry a very decided increase in value of products is shown from 1904 to 1909, accompanied by an increase of 15 per cent in the number of wage earners. The establishments are located principally in the southern and western, or cotton-growing, sections of the state.

*Iron and steel, blast furnaces.*—The industry shows a decrease of 27 per cent in value of products from 1899 to 1904. During the period from 1904 to 1909, however, the industry felt the stimulating effect of the increased demand for pig iron, and with the development of extensive ore beds the industry has nearly recovered from the depression of 1904.

*Textiles.*—The textile industries of the state—consisting of the manufacture of cotton goods, hosiery and knit goods, and woolen and worsted goods—are important branches of the state's manufacturing interests. Combined, the three allied branches gave employment to an average of 7,849 wage earners during 1909, and the value of their products amounted to \$10,568,000, these figures representing 10.6 per cent and 5.9 per cent, respectively, of the corresponding totals for all manufacturing industries in the state.

Measured by value added by manufacture, only 5 of the 40 industries presented separately in the above table held the same rank as when measured by value of products. Interesting variations in this respect are shown for some of the industries. Printing and publishing and the flour and grist mills exchange places,

the former taking second place and the latter industry going to fourth place. The manufacture of patent medicines and compounds displaces the cottonseed-oil industry from sixth place, the latter industry dropping to eleventh place. Blast furnaces drop from eighth place in value of products to thirteenth in value added by manufacture. Still greater variations are shown for the leather, distilled-liquor, slaughtering and meat-packing, and malt-liquor industries.

Wherever comparative figures can be given, this table shows also the percentages of increase for these leading industries in value of products and value added by manufacture. During the five-year period, 1904 to 1909, the distillery, hosiery and knit-goods, and ice industries showed large increases in gross value of products as well as in value added by manufacture. Six of the industries listed separately, namely, the manufacture of carriages and wagons, the tanning and finishing of leather, and the coke, paint and varnish, lime, and canning and preserving industries showed decreases in value of products from 1904 to 1909, while 8 industries showed decreases during the same period in value added by manufacture. None of these decreases, however, occurred among the 10 leading industries in the state. From 1899 to 1904 there was only 1 industry which showed a decrease in value of products, but 7 showed a decrease in value added by manufacture.

**Persons engaged in manufacturing industries.**—The following table shows, for 1909, the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables is an estimate obtained by the method described in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
<b>All classes.....</b>	<b>87,672</b>	<b>77,277</b>	<b>10,395</b>
Proprietors and officials.....	8,393	8,252	141
Proprietors and firm members.....	5,415	5,303	112
Salaried officers of corporations.....	1,216	1,203	13
Superintendents and managers.....	1,762	1,746	16
Clerks.....	5,439	4,377	1,062
Wage earners (average number).....	73,840	64,648	9,192
16 years of age and over.....	71,395	63,016	8,379
Under 16 years of age.....	2,445	1,632	813

The average number of persons engaged in manufactures during 1909 was 87,672, of whom 73,840 were wage earners. Of the remainder, 8,393 were proprietors and officials and 5,439 were clerks. Corresponding figures for individual industries will be found in Table II, page 22.

The following table shows, for 1909, the percentage of proprietors and officials, clerks, and wage earners, respectively, among the total number of persons employed in manufactures. It covers all industries combined and 16 important industries individually:

INDUSTRY.	PERSONS ENGAGED IN MANUFACTURES.			
	Total number.	Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
<b>All Industries.....</b>	<b>87,672</b>	<b>9.6</b>	<b>6.2</b>	<b>84.2</b>
Bread and other bakery products.....	1,179	14.8	12.7	72.5
Carriages and wagons and materials.....	1,992	11.6	2.7	85.0
Cars and general shop construction and repairs by steam-railroad companies....	5,884	1.4	4.0	94.6
Clothing, men's, including shirts.....	1,892	5.3	10.4	84.4
Cotton goods, including cotton small wares.	3,164	1.6	1.1	97.3
Fertilizers.....	670	5.2	11.3	83.4
Flour-mill and gristmill products.....	2,658	31.2	9.5	59.3
Foundry and machine-shop products.....	4,694	6.4	7.5	86.1
Furniture and refrigerators.....	2,667	4.6	4.7	90.7
Hosiery and knit goods.....	3,229	1.9	1.5	96.6
Iron and steel, blast furnaces.....	1,268	3.8	6.1	90.1
Lumber and timber products.....	20,283	12.6	2.2	85.2
Oil, cottonseed, and cake.....	957	6.0	9.8	84.2
Patent medicines and compounds and druggists' preparations.....	998	13.7	42.9	43.4
Printing and publishing.....	4,442	15.1	10.3	65.6
Woolen, worsted, and felt goods, and wool hats.....	1,737	2.8	2.0	95.2
All other industries.....	23,958	8.9	7.7	83.4

Of the total number of persons engaged in all manufacturing industries, 9.6 per cent were proprietors and officials, 6.2 per cent clerks, and 84.2 per cent wage earners. In the flour-mill and gristmill industry the majority of the establishments are small and the work is to a large extent done by the proprietors or their immediate representatives, so that the proportion of persons engaged in this industry falling in the class of proprietors and officials is very much higher than for any other industry or for all industries combined. Similar conditions prevail to some extent in the lumber and timber products, bakery, and printing and publishing industries, and in the manufacture of patent medicines and compounds, and carriages and wagons. The small proportion of this class shown for the cotton-goods and the steam-railroad repair shop industries is due to the comparatively large number of wage earners employed.

The following table shows for 1909, in percentages, for all industries combined, the distribution of the average number of wage earners by age periods, and for those 16 years of age and over by sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries separately, a similar distribution of wage earners as reported for December 15, or the nearest representative day. As a means of judging the importance of the several industries the average number employed for the year is also given in each case.

INDUSTRY.	WAGE EARNERS.			
	Average number.	Per cent of total.		
		16 years of age and over.		Under 16 years of age.
		Male.	Female.	
All industries.....	73,840	85.3	11.3	3.3
Bread and other bakery products.....	855	71.9	26.1	2.0
Carriages and wagons and materials.....	1,706	99.1	0.2	0.6
Cars and general shop construction and repairs by steam-railroad companies.....	5,566	99.7	0.3	( <sup>2</sup> )
Clothing, men's, including shirts.....	1,596	19.2	79.1	1.7
Cotton goods, including cotton small wares.....	3,078	44.5	37.9	17.6
Fertilizers.....	559	100.0	.....	.....
Flour-mill and gristmill products.....	1,577	99.0	0.1	0.9
Foundry and machine-shop products.....	4,041	98.6	0.2	1.2
Furniture and refrigerators.....	2,419	91.4	2.8	5.8
Hosiery and knit goods.....	3,117	25.8	57.6	16.6
Iron and steel, blast furnaces.....	1,143	99.1	.....	0.9
Lumber and timber products.....	22,389	98.0	0.6	1.4
Oil, cottonseed, and cake.....	806	99.9	0.1	.....
Patent medicines and compounds and druggists' preparations.....	433	41.3	58.2	0.5
Printing and publishing.....	2,914	76.9	20.2	3.0
Woolen, worsted, and felt goods, and wool hats.....	1,654	44.6	44.7	10.8
All other industries.....	19,987	86.7	10.6	2.7

<sup>1</sup> For method of estimating the distribution, by sex and age periods, of the average number in all industries combined, see Introduction.  
<sup>2</sup> Less than one-tenth of 1 per cent.

For all industries combined, 85.3 per cent of the average number of wage earners were males 16 years of age and over, 11.3 per cent females 16 years of age and over, and 3.3 per cent children under 16 years of age. The larger part of the total number of female wage earners is made up of those employed in the men's clothing and the textile industries. In the men's clothing industry over three-fourths of the wage earners are women 16 years of age and over; in the cotton-goods industry, over one-third; in the hosiery and knit-goods industry, more than one-half; and in the woolen mills, a little less than one-half. The proportions which the number of children formed of the total number of wage earners engaged in each of the textile industries were as follows: Cotton goods, 17.6 per cent; hosiery and knit goods, 16.6 per cent; and woolen goods, 10.8 per cent.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904, it is necessary to use the classification employed at the earlier census. (See Introduction.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				Per cent of increase, 1904-1909.
	1909		1904		
	Number.	Percent distribution.	Number.	Percent distribution.	
Total.....	87,672	100.0	69,287	100.0	28.5
Proprietors and firm members.....	5,415	6.2	3,805	5.5	42.3
Salaried employees.....	8,417	9.6	4,910	7.1	71.4
Wage earners (average number).....	73,840	84.2	60,572	87.4	21.9

Comparable figures are not obtainable for 1899. Salaried employees show the greatest percentage of increase. Although the greatest actual gain in persons engaged in manufactures was in wage earners, this

class shows the smallest percentage of increase and is the only one which shows a decrease in relative numerical importance.

The next table shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over according to sex, for 1909, 1904, and 1899. The averages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Percent distribution.	Number.	Percent distribution.	Number.	Percent distribution.
Total.....	73,840	100.0	60,572	100.0	45,963	100.0
16 years of age and over.....	71,395	96.7	58,368	96.4	43,070	93.7
Male.....	63,016	85.3	51,757	85.4	39,095	85.1
Female.....	8,379	11.3	6,611	10.9	4,875	10.6
Under 16 years of age.....	2,445	3.3	2,204	3.6	1,993	4.3

This table shows that, while for all industries combined there were increases from 1899 to 1904 and from 1904 to 1909 in the number of children under 16 years of age employed, the proportion which the children form of the total number of wage earners has decreased from census to census. There has not been much change in the proportion of male and of female wage earners 16 years of age and over. In 1909 males 16 years of age and over formed 85.3 per cent of all wage earners, as compared with 85.4 per cent in 1904 and 85.1 per cent in 1899.

**Wage earners employed by months.**—The following table gives the number of wage earners employed on the 15th of each month during the year 1909, for all industries combined, for canning and preserving, for the lumber and timber and the cottonseed-oil industries, and for all other industries combined; it gives also the percentage which the number reported for each month is of the greatest number reported for any one month. In Table II, page 22, are shown for practically all of the important industries in the state, the largest number and the smallest number of wage earners reported for any month. The figures are for the 15th day, or the nearest representative day, of the month. The wage earners for the lumber industry are divided in the table so as to show separately the number employed in the mills and the number engaged in logging operations.

A little more than 30 per cent of the total average number of wage earners in all industries combined are employed in the lumber and timber industry, and the variation in the number of wage earners employed from month to month for all industries follows closely the variation in the number employed in that one industry. In the lumber mills the minimum number was reported for January. There was an increase from January to March, followed by a decrease from March to June, but from June to November, when the maximum number, 19,249, was employed, the number con-

MANUFACTURES—TENNESSEE.

stantly increased from month to month. In logging operations the least number was employed in May and the greatest in November. A greater variation occurred in the number of wage earners employed in the cottonseed-oil and the canning and preserving industries, but as the number employed was comparatively small, the fluctuation does not materially affect the total for all industries. As in the lumber and timber

industry, the maximum number in the cottonseed-oil mills was employed in November. The proportion of the maximum represented by the number reported for the summer months was very low. The canning and preserving industry is particularly seasonal in its character, the number employed varying from 3 in March, probably watchmen or caretakers, to 1,411 in August.

MONTH.	NUMBER OF WAGE EARNERS.													
	All industries.		Canning and preserving.		Lumber and timber products.						Oil, cottonseed, and cake.		All other industries.	
					Total.		In mills.		In logging operations.					
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January	69,305	85.0	10	0.7	20,020	81.0	16,110	83.7	4,510	72.6	1,306	93.7	47,399	88.1
February	69,074	86.7	10	0.7	20,963	82.3	16,481	85.6	4,482	72.1	1,144	82.1	47,857	89.0
March	71,073	88.1	3	0.2	21,771	85.5	17,265	89.7	4,506	72.5	918	65.9	48,381	89.9
April	70,666	87.6	11	0.8	21,485	84.4	16,961	88.1	4,524	72.8	523	37.5	48,647	90.4
May	69,713	86.4	15	1.1	20,969	82.4	16,646	86.5	4,323	69.6	457	32.8	48,272	89.7
June	70,123	86.0	15	1.1	20,651	81.1	16,241	84.4	4,410	71.0	213	15.3	49,244	91.5
July	71,155	88.2	361	25.0	21,080	82.8	16,406	85.2	4,674	75.2	186	13.3	49,528	92.1
August	74,959	92.0	1,411	100.0	22,180	87.1	16,850	87.5	5,330	85.9	206	14.8	51,150	95.1
September	78,850	97.7	1,243	88.1	23,065	94.1	18,217	94.6	5,748	92.5	685	49.1	52,057	98.4
October	80,011	99.2	504	35.7	24,080	98.1	18,873	98.0	6,107	98.3	1,363	97.8	53,164	98.8
November	80,670	100.0	25	1.8	25,462	100.0	19,240	100.0	6,213	100.0	1,394	100.0	53,795	100.0
December	79,587	98.0	25	1.8	24,537	96.4	19,055	99.0	5,482	88.2	1,280	91.8	53,745	99.9

Prevailing hours of labor.—In the next table wage earners have been classified according to the hours of labor prevailing in the establishments in which they are employed.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries	73,840	3,579	2,040	9,957	7,416	39,806	6,126	2,419	2,497
Agricultural implements	645	1		154		490			
Boots and shoes, including cut stock and findings	374			73	101	200			
Boxes, fancy and paper	202			21	87	94			
Bread and other bakery products	855	34	15	161	67	412	113	38	25
Brick and tile	1,281	28	27	43	51	1,017	26	78	11
Canning and preserving	303	30	31	16	20	130	51	25	
Carrriages and wagons and materials	1,706	102	89	100	201	1,211	1	2	
Cars and general shop construction and repairs by steam-railroad companies	5,586	218		4,305	887	14	142		
Clothing, men's, including shirts	1,500	103	205	423	551	314			
Coffins, burial cases, and undertakers' goods	480		88	13	156	223			
Coke	250	44		56		144	6		
Confectionery	804	4	8	18	373	428	55	8	
Cooperage and wooden goods, not elsewhere specified	856	29		3	25	709			
Copper, tin, and sheet-iron products	572	129	90	96	2	255			
Cotton goods, including cotton small wares	3,078			65		1,333	1,643	37	
Fertilizers	550	1			46	512			
Flour-mill and gristmill products	1,577	167	5	3		410	78	913	1
Foundry and machine-shop products	4,041	10	13	1,005	441	2,551	19	2	
Furniture and refrigerators	2,419		31	256	580	1,321	267	24	
Gas, illuminating and heating	422					1	81	103	237
Hosiery and knit goods	3,117				840	1,323	954		
Ice, manufactured	770	2				23	56	87	611
Iron and steel, blast furnaces	1,143					180		73	881
Leather goods	604	8	8	99	180	309			
Leather, tanned, curried, and finished	395	1			11	383			
Lime	415			18	32	218	66	41	49
Liquors, distilled	154	2		11		117		24	
Liquors, malt	392	182		124	111			25	
Lumber and timber products	22,389	729	704	826	933	17,073	1,177	46	1
Marble and stone work	1,006	80	6	188	23	434	246		29
Mattresses and spring beds	272	5	61	67	14	125			
Millinery and lace goods	92	5		72		15			
Oil, cottonseed, and cake	896							806	
Paint and varnish	71			4		67			
Patent medicines and compounds and druggists' preparations	433	46	70	90	175	50	2		
Pottery, terra-cotta, and fire-clay products	323	39				36	248		
Printing and publishing	2,914	1,140	386	782	262	335			
Slaughtering and meat packing	280	4		2		249		2	23
Stoves and furnaces, including gas and oil stoves	1,085	5	98	239	7	736			
Woolen, worsted, and felt goods, and wool hats	1,654	1			67	1,029	557		
All other industries	7,840	471	105	624	1,183	4,336	398	85	638

In making this classification the average number of wage earners employed during the year is used, and the number employed in each establishment is classified as a total according to the hours prevailing in that establishment, even though a few employees work a greater or less number of hours.

For more than one-half of the wage earners employed in the manufacturing industries of Tennessee the prevailing hours of labor are 60 a week. Nearly one-fourth of the total work from 54 to 60 hours a week; 7.6 per cent are employed in establishments where the prevailing hours are less than 54 a week; and 15 per cent in establishments where they are more than 60 a week.

It will be noted that the foundry and machine-shop, hosiery and knit-goods, furniture, and lumber and timber industries, as well as a number of others, are mainly on a 60-hour-per-week basis, but that the flour-mill and gristmill and the cottonseed-oil industries are largely on a 72-hour-per-week basis. In the majority of establishments engaged in the manufacture of ice and in the operation of blast furnaces wage earners are usually employed over 72 hours per week, these long hours being doubtless explained by the operation of the establishments on Sunday.

**Location of establishments.**—The next table shows the extent to which the manufactures of Tennessee are centralized in cities of 10,000 population and over. (See Introduction.) The population in 1900 was used as the basis in making the classification for 1904 as well as for 1899.

ITEM.	Year.	Total.	LOCATION OF ESTABLISHMENT.		PER CENT OF TOTAL.	
			In cities with population of 10,000 and over.	Outside districts.	In cities with population of 10,000 and over.	Outside districts.
Population.....	1910	2,184,789	338,198	1,846,591	15.5	84.5
	1900	2,020,616	260,487	1,760,129	12.9	87.1
Number of establishments.	1909	4,609	1,009	3,510	23.8	76.2
	1904	3,175	903	2,272	28.4	71.6
	1899	3,116	744	2,372	23.9	76.1
Average number of wage earners.	1909	73,840	28,236	45,604	38.2	61.8
	1904	60,572	26,093	34,479	43.1	56.9
	1899	45,963	23,302	22,661	50.7	49.3
Value of products...	1909	\$180,216,548	\$86,786,821	\$93,429,727	48.2	51.8
	1904	137,960,476	64,888,160	73,072,316	47.0	53.0
	1899	92,749,129	47,831,174	44,917,955	51.6	48.4
Value added by manufacture.	1909	76,200,714	36,729,504	39,471,210	48.2	51.8
	1904	58,608,730	28,309,310	30,299,411	48.3	51.7
	1899	38,190,090	20,259,432	17,930,658	53.0	47.0

In 1909, 48.2 per cent of the total value of products and 38.2 per cent of the average number of wage earners were reported from cities having over 10,000 inhabitants. While very little change took place during the last 10 years in the relative number of establishments in the cities of over 10,000 inhabitants and in the remainder of the state, the outside districts show a substantial increase over the cities in

the average number of wage earners employed, and smaller relative increase in value of products and in value added by manufacture.

The population for 1910 and 1900 of the five cities which had 10,000 inhabitants and over in 1910 is given in the following tabular statement:

CITY.	1910	1900
Memphis.....	131,105	102,320
Nashville.....	110,364	80,865
Chattanooga.....	44,004	30,154
Knoxville.....	36,346	32,637
Jackson.....	15,779	14,511

The relative importance in manufactures of these cities is shown in the following table, in which the value of products and average number of wage earners are shown separately for 1909, 1904, and 1899:

CITY.	AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.		
	1909	1904	1899	1909	1904	1899
Memphis <sup>1</sup> .....	7,027	7,374	6,020	\$30,241,519	\$20,043,192	\$14,233,483
Nashville <sup>1</sup> .....	6,721	8,032	6,726	29,649,697	21,567,013	15,301,096
Chattanooga <sup>1</sup> .....	6,410	6,420	4,720	16,036,455	14,201,390	10,517,886
Knoxville <sup>1</sup> .....	2,773	2,900	4,203	8,149,377	6,668,850	6,201,840
Jackson.....	1,405	1,208	1,018	2,709,773	2,317,715	1,576,800

<sup>1</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

Each city shows an increase in the value of products from 1899 to 1904 and from 1904 to 1909. During the period from 1904 to 1909 Memphis shows the greatest rate of gain and Chattanooga the smallest. In average number of wage earners Knoxville shows a decrease during each of the five-year periods, Chattanooga a slight decrease from 1904 to 1909, while the other three cities show increases for both periods.

Memphis, the largest city in the state, shows an increase in 1909, as compared with 1904, of \$10,198,327, or 50.9 per cent, in value of products, and of 553, or 7.5 per cent, in the average number of wage earners. The leading manufactures of this city are flour-mill and gristmill products, food preparations, lumber and timber products, cottonseed-oil and tobacco manufactures. In 1909, 65.5 per cent of the total value of cottonseed products manufactured in the state was reported from Memphis.

The increase in value of products for Nashville from 1904 to 1909 was \$8,082,684, or 37.5 per cent. The flour-mill and gristmill and printing and publishing industries of this city contributed 19.7 per cent and 45.8 per cent, respectively, of the total value of products of these industries in the state.

Chattanooga's chief industry was the manufacture of foundry and machine-shop products. Other important manufactures, however, were flour-mill and gristmill products, lumber, malt liquors, and furniture.

In Knoxville the flour-mill and gristmill industry was the most important, followed by the men's clothing

industry. Of the total value of men's clothing manufactured in the state in 1909, Knoxville reported 38.2 per cent. The lumber and timber industry and printing and publishing are other important industries.

The leading manufacturing industries of Jackson are the steam-railroad repair shops, foundries and machine shops, the lumber and timber industry, and the cottonseed-oil mills.

The statistics for that part of Bristol which lies in Tennessee are included with those for the outside district in the table on page 9. The table in the next column presents the totals for the entire city and for the parts situated in Tennessee and Virginia, respectively.

The leading industries of Bristol, Tenn., are the flour-mill and gristmill industry and the manufacture of dyestuffs and extracts, and those of Bristol, Va., are the flour-mills and gristmills, the manufacture of paper and wood pulp, the lumber and timber industry, and the steam-railroad repair shops.

	Total for city.	Bristol, Tenn.	Bristol, Va.
Population (1910).....	13,395	7,148	6,247
Number of establishments.....	51	23	28
Persons engaged in manufactures.....	1,310	377	933
Proprietors and firm members.....	42	22	20
Salaries employees.....	148	68	80
Wage earners (average number).....	1,129	287	842
Primary horsepower.....	3,914	1,289	2,625
Capital.....	\$3,062,409	\$1,345,671	\$1,716,738
Expenses.....	2,619,392	820,676	1,798,716
Services.....	631,813	160,327	471,486
Salaries.....	142,741	53,615	89,126
Wages.....	489,072	106,712	382,360
Materials.....	1,828,296	593,974	1,234,322
Miscellaneous.....	169,283	66,375	102,908
Value of products.....	2,848,777	878,100	1,970,668
Value added by manufacture (value of products less cost of materials).....	1,020,481	284,135	736,346

Character of ownership.—The table that follows presents conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>					<b>Foundry and machine-shop products, 1909.....</b>	124	4,041	\$9,189,791	\$4,029,591
1909.....	4,609	73,840	\$180,216,548	\$76,200,714	Individual.....	35	413	868,751	427,840
1904.....	3,175	60,572	137,960,476	58,608,730	Firm.....	20	150	352,709	214,384
Individual:					Corporation.....	69	3,469	7,968,271	3,987,404
1909.....	2,182	11,349	22,206,362	10,635,380	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	1,345	8,717	17,339,985	8,277,012	Individual.....	28.2	10.2	0.5	0.2
Firm:					Firm.....	23.4	3.9	3.8	4.5
1909.....	1,330	10,380	23,227,921	10,487,841	Corporation.....	48.4	85.8	96.8	89.1
1904.....	1,035	9,793	23,300,353	9,046,132	<b>Furniture and refrigerators, 1909.....</b>	42	2,419	\$3,309,385	\$1,801,512
Corporation:					Individual.....	7	222	194,084	125,184
1909.....	1,068	51,716	133,750,538	54,238,109	Firm.....	4	93	69,687	34,884
1904.....	785	42,049	97,286,790	40,362,147	Corporation.....	31	2,104	3,045,614	1,701,438
Other:					Per cent of total.....	100.0	100.0	100.0	100.0
1909.....	29	389	1,031,727	839,484	Individual.....	16.7	9.2	5.9	6.7
1904.....	10	13	34,339	23,439	Firm.....	9.5	3.8	2.1	1.9
Per cent of total:					Corporation.....	73.8	87.0	92.0	91.3
1909.....	100.0	100.0	100.0	100.0	<b>Lumber and timber products, 1909.....</b>	1,977	22,389	\$30,456,807	\$16,815,365
1904.....	100.0	100.0	100.0	100.0	Individual.....	1,101	6,676	6,690,074	4,141,337
Individual:					Firm.....	665	5,966	6,567,393	4,101,112
1909.....	47.3	15.4	12.3	14.0	Corporation.....	211	9,807	17,199,340	8,573,017
1904.....	42.4	14.4	12.6	14.1	Per cent of total.....	100.0	100.0	100.0	100.0
Firm:					Individual.....	55.7	29.8	22.0	24.2
1909.....	28.9	14.1	12.9	13.8	Firm.....	33.6	26.4	21.6	24.4
1904.....	32.6	14.2	16.9	17.0	Corporation.....	10.7	43.8	56.5	51.4
Corporation:					<b>Patent medicines and compounds and druggists' preparations, 1909.....</b>	76	433	\$3,514,676	\$2,173,870
1909.....	23.2	70.0	74.2	71.2	Individual.....	15	12	53,072	36,287
1904.....	24.7	69.4	70.5	68.9	Firm.....	15	194	1,778,181	1,201,959
Other:					Corporation.....	46	227	1,683,423	835,183
1909.....	0.6	0.5	0.6	1.1	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	0.3	(1)	(1)	(1)	Individual.....	19.7	2.8	1.5	1.7
<b>Carriages and wagons and materials, 1909.....</b>	129	1,766	\$3,039,813	\$1,000,187	Firm.....	19.7	44.8	50.6	53.3
Individual.....	46	284	404,778	216,434	Corporation.....	60.5	52.4	47.9	44.9
Firm.....	44	297	505,542	307,132	<b>Printing and publishing, 1909.....</b>	413	2,914	\$7,173,230	\$5,919,655
Corporation.....	39	1,125	2,129,293	1,076,621	Individual.....	208	429	793,011	694,188
Per cent of total.....	100.0	100.0	100.0	100.0	Firm.....	93	440	876,470	692,723
Individual.....	35.7	16.6	13.3	13.5	Corporation.....	84	1,663	4,488,645	3,188,829
Firm.....	34.1	17.4	16.0	19.2	Other.....	28	385	1,015,104	834,375
Corporation.....	30.2	65.9	70.1	67.3	Per cent of total.....	100.0	100.0	100.0	100.0
<b>Clothing, men's, including shirts, 1909.....</b>	34	1,596	\$3,361,105	\$1,238,595	Individual.....	50.4	14.0	11.1	11.4
Individual.....	6	21	51,069	25,111	Firm.....	22.5	15.1	12.2	11.7
Firm.....	8	481	993,241	392,690	Corporation.....	20.3	67.1	62.6	61.1
Corporation.....	20	1,094	2,316,195	820,794	Other.....	6.8	13.2	14.2	15.8
Per cent of total.....	100.0	100.0	100.0	100.0	<b>Slaughtering and meat packing, 1909.....</b>	27	280	\$2,056,719	\$446,609
Individual.....	17.6	1.3	1.5	2.0	Individual.....	11	43	306,031	77,625
Firm.....	23.5	30.1	29.6	31.7	Firm.....	9	26	256,410	82,365
Corporation.....	68.8	68.5	68.9	66.3	Corporation.....	7	211	1,494,278	286,609
<b>Flour-mill and gristmill products, 1909.....</b>	454	1,577	\$29,070,016	\$3,784,153	Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	208	859	5,493,218	891,518	Individual.....	40.7	15.4	14.9	17.4
Firm.....	187	361	5,870,094	987,150	Firm.....	33.3	9.3	12.5	18.6
Corporation.....	64	857	17,706,707	1,905,479	Corporation.....	25.9	75.4	72.7	64.0
Per cent of total.....	100.0	100.0	100.0	100.0					

<sup>1</sup> Less than one-tenth of 1 per cent.

In order to avoid disclosing the operations of individual concerns, it is necessary to omit several important industries from the preceding table and the one following.

The most important distinction shown is that between corporate and all other forms of ownership. For all industries combined, 23.2 per cent of the total number of establishments were in 1909 under corporate ownership, as against 76.8 per cent under all other forms. The corresponding figures for 1904 were 24.7 per cent and 75.3 per cent, respectively. The percentage of the total value of products contributed by establishments under corporate ownership increased from 70.5 per cent in 1904 to 74.2 per cent in 1909, while for the same period the percentage contributed by those under firm ownership decreased from 16.9 per cent to 12.9 per cent. The percentage of the value added by manufacture contributed by the establishments under corporate ownership increased from 68.9 per cent in 1904 to 71.2 per cent in 1909, while the percentage contributed by those under firm ownership decreased during the same period from 17 per cent to 13.8 per cent.

In four of the individual industries for which figures are given in the table, namely, the men's clothing industry, foundries and machine shops, the manufacture of furniture and refrigerators, and patent medicines and compounds, there was a larger number of establishments under corporate management than under any other. In every industry shown separately in the table, except the manufacture of patent medicines and compounds, the establishments operated by corporations contributed the greater part of the total value of products and of the total value added by manufacture.

**Size of establishment.**—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it, two tables are presented, which group establishments by value of products (page 12), and by number of wage earners (page 13).

**Size measured by value of products.**—The table on the next page shows, in addition to certain size groups, the average size of establishments as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the last two censuses, while for individual industries figures are given for 1909 only. In 1909, of the 4,609 establishments only 17, or four-tenths of 1 per cent, had a value of products exceeding \$1,000,000. These establishments, however, employed an average of 6,423 wage earners, or 8.7 per cent of the total number in all establishments, and reported 17 per cent of the total value of products, and 12.2 per cent of the total value added by manufacture.

On the other hand, the very small establishments—that is, those having a value of products of less than

\$5,000—constituted a very considerable proportion (45.2 per cent) of the total number of establishments, but the value of their products amounted to only 2.6 per cent of the total. The great bulk of the manufacturing was reported by establishments having products valued at not less than \$100,000.

It will be seen from the table on page 12 that during the five years from 1904 to 1909 there was an increase, when measured by value of products, in the relative importance of the large establishments—those reporting products valued at not less than \$100,000—and also in that of the very small establishments—those reporting products under \$5,000 in value. Establishments in each of these two classes gave employment to a larger proportion of the total number of wage earners, and reported a larger proportion of the total value of products and of the total value added by manufacture in 1909 than in 1904. Decreases are shown in the corresponding proportions for establishments reporting products of between \$5,000 and \$100,000 in value.

There was a general decrease in the average size of manufacturing establishments from 1904 to 1909. The average value of products per establishment decreased during the period from \$43,452 to \$39,101, the value added by manufacture from \$18,459 to \$16,533, and the average number of wage earners per establishment from 19 to 16.

Of the individual industries for which figures are given in the table, those in which the average size of the establishment as measured by value of products is smallest are the lumber and timber, and the printing and publishing industries. In each of these industries more than 60 per cent of the establishments reported products valued at less than \$5,000 for the year. The industries in which the establishments averaged the largest were the men's clothing, furniture and refrigerator, and slaughtering and meat-packing industries, in which 73.6 per cent, 64.3 per cent, and 59.2 per cent, respectively, of the establishments reported products valued at \$20,000 or over.

**Size measured by number of wage earners.**—In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The table on page 13 shows for 1909 such a classification for all industries combined and for 16 important industries individually, and gives not only the number of establishments falling in each group but also the average number of wage earners employed.

Of the 4,609 establishments reported for all industries, 6.6 per cent employed no wage earners; 54.3 per cent employed from 1 to 5; and 25.5 per cent from 6 to 20. The most numerous single group consists of the 2,505 establishments employing from 1 to 5 wage earners, and the next of the 1,174 establishments employing from 6 to 20. There were 153 establishments that

MANUFACTURES—TENNESSEE.

employed over 100 wage earners each, while 10 employed over 500 each, and one of them, a steam-railroad repair shop, employed over 1,000.

Of the total number of wage earners, 46 per cent were in establishments employing over 100 wage earners. The single group having the largest number of wage earners was the group comprising the establishments employing from 101 to 250 each. This group employed 17,173 wage earners, or 23.3 per cent of the

total. Of the individual industries listed in this table but not in the preceding one, steam-railroad repair shops, the cotton-goods, the hosiery and knit-goods, and the woolen-goods industries are conducted in comparatively large establishments, as appears from the classification according to the number of wage earners employed. The majority of the blast furnaces employ a relatively small number of wage earners.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>									
1909.....	4,609	73,840	\$180,216,548	\$78,200,714	<b>Foundry and machine-shop products, 1909.....</b>	124	4,041	\$9,189,791	\$4,629,591
1904.....	3,176	60,572	137,960,476	58,608,730	Less than \$5,000.....	29	52	72,293	46,655
Less than \$5,000:					\$5,000 and less than \$20,000.....	34	200	345,065	197,597
1909.....	2,082	5,541	4,640,418	3,058,539	\$20,000 and less than \$100,000.....	42	1,138	1,064,688	1,108,527
1904.....	1,015	1,784	2,607,791	1,766,725	\$100,000 and less than \$1,000,000 <sup>2</sup> .....	19	2,642	6,806,845	3,270,512
\$5,000 and less than \$20,000:					<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
1909.....	1,352	8,075	13,380,348	7,335,137	Less than \$5,000.....	23.4	1.3	0.8	1.0
1904.....	1,084	6,260	11,301,080	6,129,232	\$5,000 and less than \$20,000.....	27.4	5.2	3.8	4.3
\$20,000 and less than \$100,000:					\$20,000 and less than \$100,000.....	33.9	23.2	21.4	23.9
1909.....	789	15,379	34,700,071	15,749,778	\$100,000 and less than \$1,000,000 <sup>2</sup> .....	15.3	65.4	74.1	70.8
1904.....	766	16,318	33,535,276	15,427,691	Average per establishment.....		33	\$74,111	\$37,335
\$100,000 and less than \$1,000,000:					<b>Furniture and refrigerators, 1909.....</b>	42	2,419	\$3,309,385	\$1,861,512
1909.....	369	37,822	96,928,660	40,751,742	Less than \$5,000.....	3	7	0,672	5,259
1904.....	299	30,410	71,720,062	29,694,696	\$5,000 and less than \$20,000.....	12	99	120,911	70,018
\$1,000,000 and over:					\$20,000 and less than \$100,000.....	13	635	687,780	347,046
1909.....	17	6,423	30,597,045	9,305,518	\$100,000 and less than \$1,000,000.....	14	1,678	2,404,022	1,438,298
1904.....	11	5,791	18,796,261	5,590,380	<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
<b>Per cent of total:</b>					Less than \$5,000.....	7.1	0.3	0.2	0.3
1909.....	100.0	100.0	100.0	100.0	\$5,000 and less than \$20,000.....	28.6	4.1	3.7	3.8
1904.....	100.0	100.0	100.0	100.0	\$20,000 and less than \$100,000.....	31.0	26.2	20.8	18.0
Less than \$5,000:					\$100,000 and less than \$1,000,000.....	33.3	69.4	75.4	77.3
1909.....	46.2	7.5	2.6	4.0	Average per establishment.....		53	\$78,795	\$44,322
1904.....	32.0	2.9	1.9	3.0	<b>Lumber and timber products, 1909.....</b>	1,977	22,389	\$30,456,807	\$16,815,366
\$5,000 and less than \$20,000:					Less than \$5,000.....	1,198	4,085	2,572,282	1,771,690
1909.....	20.3	11.7	7.4	9.6	\$5,000 and less than \$20,000.....	536	4,961	4,956,787	3,177,175
1904.....	34.1	10.3	8.2	10.5	\$20,000 and less than \$100,000.....	174	4,505	7,316,344	3,975,519
\$20,000 and less than \$100,000:					\$100,000 and less than \$1,000,000.....	69	8,778	15,611,394	7,891,582
1909.....	17.1	20.8	19.3	20.7	<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
1904.....	24.1	20.9	24.3	26.3	Less than \$5,000.....	60.6	18.2	8.4	10.5
\$100,000 and less than \$1,000,000:					\$5,000 and less than \$20,000.....	27.1	22.2	16.3	18.9
1909.....	8.0	51.2	53.8	53.5	\$20,000 and less than \$100,000.....	8.8	20.4	24.0	23.7
1904.....	9.4	60.2	52.0	60.7	\$100,000 and less than \$1,000,000.....	3.5	39.2	51.3	47.0
\$1,000,000 and over:					Average per establishment.....		11	\$15,406	\$8,595
1909.....	0.4	8.7	17.0	12.2	<b>Patent medicines and com- pounds and druggists' pre- parations, 1909.....</b>	76	433	\$3,514,676	\$2,173,870
1904.....	0.3	0.6	13.6	0.5	Less than \$5,000.....	30	12	52,462	36,915
Average per establishment:					\$5,000 and less than \$20,000.....	23	50	239,750	161,394
1909.....	16		\$39,101	\$16,533	\$20,000 and less than \$100,000.....	18	117	982,421	531,720
1904.....	19		43,452	18,469	\$100,000 and less than \$1,000,000.....	5	245	2,240,043	1,443,811
<b>Carrriages and wagons and materials, 1909.....</b>	129	1,706	\$3,039,613	\$1,600,187	<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
Less than \$5,000.....	47	150	135,408	88,742	Less than \$5,000.....	39.5	2.8	1.5	1.7
\$5,000 and less than \$20,000.....	45	298	432,681	293,791	\$5,000 and less than \$20,000.....	30.3	13.0	6.8	7.4
\$20,000 and less than \$100,000.....	30	753	1,290,524	655,244	\$20,000 and less than \$100,000.....	23.7	27.0	28.0	24.5
\$100,000 and less than \$1,000,000.....	7	505	1,181,000	582,410	\$100,000 and less than \$1,000,000.....	6.6	56.6	63.7	66.4
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0	Average per establishment.....		6	\$46,246	\$28,604
Less than \$5,000.....	36.4	8.8	4.5	5.5	<b>Printing and publishing, 1909.....</b>	413	2,914	\$7,173,230	\$5,219,045
\$5,000 and less than \$20,000.....	34.9	17.5	14.2	16.5	Less than \$5,000.....	268	375	587,609	462,082
\$20,000 and less than \$100,000.....	23.3	44.1	42.5	41.6	\$5,000 and less than \$20,000.....	91	382	831,443	645,754
\$100,000 and less than \$1,000,000.....	5.4	29.6	38.9	36.4	\$20,000 and less than \$100,000.....	35	667	1,377,535	955,725
Average per establishment.....		13	\$23,563	\$12,405	\$100,000 and less than \$1,000,000.....	19	1,490	4,370,643	3,156,084
<b>Clothing, men's, including shirts, 1909.....</b>	34	1,598	\$3,361,105	\$1,238,595	<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
\$5,000 and less than \$20,000.....	9	53	83,333	37,395	Less than \$5,000.....	64.9	12.0	8.2	8.9
\$20,000 and less than \$100,000.....	14	426	760,659	340,784	\$5,000 and less than \$20,000.....	22.0	13.1	11.6	12.4
\$100,000 and less than \$1,000,000.....	11	1,117	2,517,113	864,416	\$20,000 and less than \$100,000.....	8.5	22.9	19.2	18.3
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0	\$100,000 and less than \$1,000,000.....	4.0	51.1	61.0	60.5
\$5,000 and less than \$20,000.....	26.5	3.3	2.5	3.0	Average per establishment.....		7	\$17,369	\$12,638
\$20,000 and less than \$100,000.....	41.2	26.7	22.6	28.0	<b>Slaughtering and meat pack- ing, 1909.....</b>	27	280	\$2,056,719	\$444,069
\$100,000 and less than \$1,000,000.....	32.4	70.0	74.9	69.0	Less than \$5,000.....	3	3	8,621	3,877
Average per establishment.....		47	\$98,856	\$36,429	\$5,000 and less than \$20,000.....	8	25	105,339	39,165
<b>Flour-mill and gristmill prod- ucts, 1909.....</b>	454	1,577	\$29,070,019	\$3,784,183	\$20,000 and less than \$100,000.....	12	101	507,223	169,130
Less than \$5,000.....	69	49	190,545	38,529	\$100,000 and less than \$1,000,000.....	4	151	1,435,536	247,497
\$5,000 and less than \$20,000.....	190	217	2,131,595	414,268	<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
\$20,000 and less than \$100,000.....	160	453	6,842,747	1,144,602	Less than \$5,000.....	11.1	1.1	0.4	0.9
\$100,000 and less than \$1,000,000.....	20	382	6,902,173	801,445	\$5,000 and less than \$20,000.....	29.6	8.9	5.1	8.1
\$1,000,000 and over.....	6	476	13,002,959	1,385,309	\$20,000 and less than \$100,000.....	44.4	36.1	24.7	35.6
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0	\$100,000 and less than \$1,000,000.....	14.8	53.9	69.8	55.4
Less than \$5,000.....	15.2	3.1	0.7	1.0	Average per establishment.....		10	\$76,175	\$16,541
\$5,000 and less than \$20,000.....	41.8	13.8	7.3	10.9					
\$20,000 and less than \$100,000.....	35.2	28.7	23.5	30.2					
\$100,000 and less than \$1,000,000.....	0.4	24.2	23.7	21.2					
\$1,000,000 and over.....	1.3	30.2	44.7	36.6					
Average per establishment.....		3	\$64,031	\$8,335					

<sup>1</sup> Includes the group "Less than \$5,000."

<sup>2</sup> Includes the group "\$1,000,000 and over."

INDUSTRY.	ESTABLISHMENTS EMPLOYING—									
	Total.	No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All industries.....	4,609	306	2,505	1,174	318	153	116	27	9	1
Bread and other bakery products.....	131	6	103	16	2	2	2			
Carriages and wagons and materials.....	120	2	65	43	12	6	1			
Cars and general shop construction and repairs by steam-railroad companies.....	17		2	3			4	5	2	1
Clothing, men's, including shirts.....	34	2	3	8	9	8	4			
Cotton goods, including cotton small wares.....	17				4	0	4	1	2	
Fertilizers.....	12		4	1	2	3	2			
Flour-mill and gristmill products.....	454	60	350	23	6	3	1			
Foundry and machine-shop products.....	124	3	43	40	16	12	7	3		
Furniture and refrigerators.....	42		10	5	10	8	1	1		
Hosiery and knit goods.....	22		1	3	2	4	9	2	1	
Iron and steel, blast furnaces.....	13				6	5	1	1		
Lumber and timber products.....	1,077	40	1,088	670	103	28	31	7	1	
Oil, cottonseed, and cake.....	20		1	2	11	5				
Patent medicines and compounds and druggists' preparations.....	76	17	43	12	3		1			
Printing and publishing.....	413	111	220	41	10	8	4	1		
Woolen, worsted, and felt goods, and wool hats.....	21	6	4	2	1	3	3	1	1	
All other industries.....	1,107	53	550	201	112	52	33	5	2	
AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	73,840	6,214	12,403	10,401	10,870	17,173	8,175	6,301	1,303	
Bread and other bakery products.....	855	232	105	64	135	250				
Carriages and wagons and materials.....	1,700	168	513	404	498	123				
Cars and general shop construction and repairs by steam-railroad companies.....	5,500	4	37			692	1,692	1,838	1,303	
Clothing, men's, including shirts.....	1,596	14	104	280	511	687				
Cotton goods, including cotton small wares.....	3,078			146	404	650	290	1,570		
Fertilizers.....	560	11	13	96	102	247				
Flour-mill and gristmill products.....	1,577	680	263	238	206	190				
Foundry and machine-shop products.....	4,041	104	504	498	831	960	1,144			
Furniture and refrigerators.....	2,410	36	65	352	582	1,133	251			
Hosiery and knit goods.....	3,117	5	48	70	258	1,385	688	603		
Iron and steel, blast furnaces.....	1,143			241	404	180	300			
Lumber and timber products.....	22,389	2,937	6,872	3,252	1,080	4,440	2,275	624		
Oil, cottonseed, and cake.....	806	2	23	340	305	136				
Patent medicines and compounds and druggists' preparations.....	433	80	108	75		161				
Printing and publishing.....	2,614	536	394	620	588	514	253			
Woolen, worsted, and felt goods, and wool hats.....	1,654	4	24	36	245	409	420	507		
All other industries.....	10,987	1,392	3,270	3,680	3,722	4,908	1,835	1,000		
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	100.0	8.4	16.8	14.1	14.7	23.3	12.4	8.5	1.8	
Bread and other bakery products.....	100.0	27.1	19.3	7.5	15.8	30.3				
Carriages and wagons and materials.....	100.0	9.8	30.1	23.7	20.2	7.2				
Cars and general shop construction and repairs by steam-railroad companies.....	100.0	0.1	0.7			12.4	30.4	33.0	23.4	
Clothing, men's, including shirts.....	100.0	0.9	0.5	17.5	32.0	43.0				
Cotton goods, including cotton small wares.....	100.0			4.7	13.1	21.1	0.7	51.3		
Fertilizers.....	100.0	2.0	2.3	17.2	34.3	44.2				
Flour-mill and gristmill products.....	100.0	43.1	16.7	15.1	13.1	12.0				
Foundry and machine-shop products.....	100.0	2.6	12.5	12.3	20.0	23.8	28.3			
Furniture and refrigerators.....	100.0	1.5	2.7	14.0	24.1	46.8	10.4			
Hosiery and knit goods.....	100.0	0.2	1.5	2.2	8.3	44.4	22.1	21.3		
Iron and steel, blast furnaces.....	100.0			21.1	35.3	16.5	27.0			
Lumber and timber products.....	100.0	13.1	30.7	14.5	8.9	10.8	10.2	2.8		
Oil, cottonseed, and cake.....	100.0	0.2	2.0	42.2	37.8	16.0				
Patent medicines and compounds and druggists' preparations.....	100.0	20.6	24.9	17.3		37.2				
Printing and publishing.....	100.0	18.4	13.5	21.6	20.2	17.6	8.7			
Woolen, worsted, and felt goods, and wool hats.....	100.0	0.2	1.5	2.2	14.8	24.7	25.0	30.7		
All other industries.....	100.0	7.0	16.4	18.4	18.6	25.0	9.2	5.5		

**Expenses.**—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses which make up the total.

The following table shows, for 1909, in percentages, the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II.

This table shows that, for all industries combined, 65.4 per cent of the total expenses was incurred for materials, 23.6 per cent for services—that is, salaries and wages—and 11 per cent for other purposes. As would be expected, these proportions vary greatly in the different industries.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries.....	5.8	17.8	65.4	11.0
Bread and other bakery products.....	5.3	14.9	71.0	8.8
Carriages and wagons and materials.....	0.3	27.3	56.6	9.8
Cars and general shop construction and repairs by steam-railroad companies.....	4.9	48.0	46.0	1.2
Clothing, men's, including shirts.....	10.0	12.9	68.4	8.7
Cotton goods, including cotton small wares.....	2.2	17.8	69.4	10.0
Fertilizers.....	4.8	7.2	74.5	13.5
Flour-mill and gristmill products.....	1.2	2.1	93.0	3.8
Foundry and machine-shop products.....	8.6	24.9	56.7	9.8
Furniture and refrigerators.....	8.6	20.9	48.3	13.1
Hosiery and knit goods.....	3.8	22.2	64.9	9.1
Iron and steel, blast furnaces.....	3.5	12.4	80.8	3.3
Lumber and timber products.....	5.3	28.0	54.8	11.9
Oil, cottonseed, and cake.....	3.4	4.8	86.4	5.5
Patent medicines and compounds and druggists' preparations.....	17.5	4.8	43.9	33.7
Printing and publishing.....	18.2	28.5	32.7	20.0
Woolen, worsted, and felt goods, and wool hats.....	4.2	24.0	64.5	7.3
All other industries.....	6.6	16.8	61.3	15.3

**Engines and power.**—The following table shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 <sup>1</sup>	1909	1904	1899 <sup>1</sup>	1909	1904	1899
<b>Primary power, total</b> .....	6,058	3,205	2,918	242,277	175,780	130,318	100.0	100.0	100.0
Owned.....	4,441	3,205	2,918	220,972	173,123	128,424	93.7	98.5	98.6
Steam.....	3,704	2,750	2,449	215,338	161,919	116,715	88.9	92.1	89.6
Gas.....	317	128	68	1,853	1,084	533	0.8	0.0	0.5
Water wheels.....	341	299	401	9,970	9,702	11,078	4.0	5.6	8.5
Water motors.....	19	22	( <sup>2</sup> )	107	233	( <sup>2</sup> )	( <sup>2</sup> )	0.1	( <sup>2</sup> )
Other.....				4	125	38	( <sup>2</sup> )	0.1	( <sup>2</sup> )
Rented.....	1,617	( <sup>2</sup> )	( <sup>2</sup> )	15,305	2,657	1,894	0.3	1.5	1.5
Electric.....	1,617	( <sup>2</sup> )	( <sup>2</sup> )	14,666	2,230	1,370	0.1	1.3	1.1
Other.....				639	427	524	0.3	0.2	0.4
<b>Electric motors</b> .....	2,579	186	46	29,586	6,586	2,193	100.0	100.0	100.0
Run by current generated by establishment.....	962	186	46	14,920	4,356	823	50.4	66.1	37.5
Run by rented power.....	1,617	( <sup>2</sup> )	( <sup>2</sup> )	14,666	2,230	1,370	49.6	33.9	62.5

<sup>1</sup> Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.  
<sup>2</sup> Not reported.  
<sup>3</sup> Less than one-tenth of 1 per cent.

The amount of primary power used in the manufacturing industries of Tennessee increased 34.9 per cent from 1899 to 1904, and 37.8 per cent from 1904 to 1909. This increase was chiefly in power generated by steam engines. From 1904 to 1909 the capacity of the steam engines increased 53,419 horsepower, or 33 per cent, yet the proportion which steam power formed of the total primary power decreased from 92.1 per cent in 1904 to 88.9 per cent in 1909. The horsepower of water wheels and water motors showed an

actual decrease. The more general use of gas engines is shown, the number and power of such engines reported in 1909 being 317 with 1,853 horsepower, as compared with 68 with 593 horsepower in 1899. The figures also show that the practice of renting electric power is on the increase, 14,666 horsepower, or 6.1 per cent of the total power reported in 1909, being rented electric power, as against 1,370 horsepower, or 1.1 per cent, in 1899. The use of electric motors for the purpose of applying the power generated within the establishments is also shown to be rapidly increasing, the horsepower of such motors having increased from 823 in 1899 to 14,920 in 1909.

**Fuel.**—Closely related to the question of kind of power employed is that of the fuel consumed in generating this power, or otherwise used as material in the manufacturing processes. The following table shows the quantity of each kind of fuel used in 1909 for all industries combined and for certain selected industries:

INDUSTRY.	An-thra-cite coal (tons).	Bitumi-nous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gaso-line (barrels).	Gas (1,000 feet).
<b>All industries</b> .....	14,115	1,681,458	691,232	94,287	65,108	15,809
Bread and other bakery products.....	853	3,238	2,861	4,634	61	1,736
Brick and tile.....		107,720	3,502	23,121	72	
Cars and general shop construction and repairs by steam-rail-road companies.....		83,602	1,280		4,300	
Coke.....		495,965			21	
Cotton goods, including cotton small wares.....	831	46,599		2,258	9	
Flour-mill and gristmill products.....	80	86,636	230	17,620	930	
Foundry and machine-shop products.....	11	46,889	43,801	1,635	746	875
Furniture and refrigerators.....		15,757	4	255	12	
Gas, illuminating and heating.....		53,000	5,067		52,732	
Hosiery and knit goods.....		22,317				440
Ice, manufactured.....		99,165		856	129	
Iron and steel, blast furnaces.....		30,298	565,386	152	201	
Liquors, malt.....		32,070				
Lumber and timber products.....	500	49,190		1,281	728	
Oil, cottonseed, and cake.....		47,208		500		
Pottery, terra-cotta, and fire-clay products.....		40,564		210	2	
Printing and publishing.....	21	11,690	375	198	521	6,681
Woolen, worsted, and felt goods, and wool hats.....		26,591		2,873	10	
All other industries.....	11,819	376,024	67,807	38,694	4,628	6,027

<sup>1</sup> In addition there were 8,819 tons of other varieties of fuel reported.

**SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.**

(With statistics for laundries and custom sawmills and gristmills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and cost of materials and the quantity and value of products and other information, for securing which no provision is made on the general schedule. Certain data of this character for eight important industries in Tennessee are here presented.

**Lumber and timber products.**—The forests of Tennessee, containing an abundant growth of many of the most valuable species of forest trees, are among the best in the United States. Lumbering has long been an important industry in the state. As early as 1849 Tennessee had, including the custom sawmills, 451 establishments which reported a total value of products amounting to \$725,387.

The following statement gives the quantity of the various products of the sawmills reported at the censuses of 1909 and 1899:

PRODUCT.	QUANTITY.	
	1909	1899
Rough lumber.....	M feet b. m. 1,223,849	950,958
Lath.....	thousands.. 31,179	33,199
Shingles.....	thousands.. 35,692	59,735

The above table shows an increase of 272,891 M feet board measure, or 28.7 per cent, in the production of rough lumber. Eighty-three per cent of the total quantity of rough lumber sawed was hardwood, the

principal kind being oak, in the production of which Tennessee was the leading state in 1909, with approximately one-eighth of the total for the United States. The state was also first in the production of yellow poplar and hickory. Decreases are shown in the production of lath and shingles.

**Flour-mill and gristmill products.**—The following tabular statement gives the quantity and value of the different products of this industry for the last three census years:

PRODUCT.	1909	1904	1899
Total value.....	\$29,070,019	\$25,350,758	\$19,161,308
Wheat flour:			
White—			
Barrels.....	2,000,501	3,184,847	3,330,040
Value.....	\$17,218,710	\$17,015,408	\$12,500,493
Graham—			
Barrels.....	9,588	1,830	(1)
Value.....	\$48,076	\$8,715	(1)
Corn meal and corn flour:			
Barrels.....	1,081,746	2,052,765	2,002,032
Value.....	\$9,505,710	\$4,771,722	\$3,905,887
Rye flour:			
Barrels.....	5	40	113
Value.....	\$20	\$160	\$348
Buckwheat flour:			
Pounds.....	21,300	103,000	49,135
Value.....	\$1,020	\$2,830	\$1,026
Barley meal:			
Pounds.....		139,600	29,800
Value.....		\$1,948	\$435
Hominy and grits:			
Pounds.....	26,720,030	36,009,405	10,465,460
Value.....	\$441,371	\$421,299	\$164,348
Feed:			
Tons.....	64,150	31,909	43,032
Value.....	\$1,057,194	\$676,234	\$632,693
Offal:			
Tons.....	127,843	136,875	138,172
Value.....	\$3,180,436	\$2,442,060	\$1,734,492
All other products.....	\$7,873	\$9,512	\$41,070

<sup>1</sup> Not reported separately.

In 1909 the value of white flour constituted 59.2 per cent of the total value of products shown for the industry, and that of corn meal and corn flour, 22.4 per cent. From 1904 to 1909 there was a large increase in both the quantity and the value of feed reported, while for white-wheat flour, corn meal and corn flour, hominy and grits, and offal decreases in quantity were accompanied by increases in value.

**Printing and publishing.**—The following statement shows the number and circulation of the newspapers and periodicals published in the state as reported for 1909, 1904, and 1899:

PERIOD OF ISSUE.	NUMBER OF PUBLICATIONS.			AGGREGATE CIRCULATION PER ISSUE.		
	1909	1904	1899	1909	1904	1899
Total.....	330	334	258	5,601,541	3,157,803	3,181,017
Daily.....	16	17	16	245,658	183,050	166,718
Sunday.....	7	9	7	183,196	125,905	(1)
Semiweekly.....	10	3	6	16,925	8,720	7,700
Weekly.....	223	230	187	923,431	753,290	1,136,199
Monthly.....	49	33	28	517,643	247,143	270,150
All other classes.....	25	42	14	3,714,688	1,839,695	1,551,250

<sup>1</sup> Included in circulation for daily.

From 1904 to 1909 there has been a decrease of four in the total number of publications, the increase in the number of monthlies and semiweeklies being more than offset by the decrease in the number of dailies, Sunday publications, weeklies, and the publications shown under the head of "All other classes."

The number of dailies and of Sunday papers were the same in 1909 as shown for 1899.

The aggregate circulation per issue shows an increase of 77.4 per cent from 1904 to 1909, as compared with an increase of less than 1 per cent from 1899 to 1904. The weeklies increased in number but decreased in circulation from 1899 to 1904, while they decreased in number but increased in circulation from 1904 to 1909. The increase in the aggregate circulation of Sunday papers from 1904 to 1909 was 45.5 per cent. About three-fourths of the periodicals classified under the head of "All other classes" are published in Nashville. They are quarterly publications of various religious organizations and consist principally of Sunday-school quarterlies, lesson leaves, and papers. They show great gains in circulation at each census.

All the publications reported were printed in the English language, except two weeklies in German and two religious quarterlies in Spanish.

**Oil, cottonseed, and cake.**—This is one of the foremost industries of the state. The quantity of cotton seed crushed and the quantity of the resultant products, namely, oil, meal and cake, hulls, and linters, are shown in the following tabular statement for the last three census years:

MATERIAL OR PRODUCT.	QUANTITY.		
	1909	1904	1899
Cotton seed, crushed.....	170,475	143,479	168,307
Crude products, manufactured:			
Oil.....	7,525,409	5,730,599	6,454,173
Meal and cake.....	76,903	58,477	59,613
Hulls.....	59,434	53,738	79,858
Linters.....	8,533,484	5,918,496	4,058,473

The totals presented include the data for all cotton seed crushed and for the crude products manufactured, whether sold as such or used as intermediate products in further processes of manufacture, such as the refining of oil and the mixing of fertilizers and feed.

There was a decrease of 24,828 tons, or 14.8 per cent, in the amount of seed crushed in 1904, as compared with 1899, but this was more than offset by an increase of 35,996 tons, or 25.1 per cent, in the amount crushed in 1909, as compared with 1904.

The production of cottonseed oil decreased in 1904, as compared with 1899, 693,574 gallons, or 10.7 per cent, and increased in 1909, as compared with 1904, 1,764,810 gallons, or 30.6 per cent. The production of linters in 1909 was more than twice that reported for 1899, while that of hulls shows a decrease of 25.6 per cent.

Of the 20 cottonseed-oil mills reported as crushing seed in 1909, 1 crushed less than 1,000 tons, 4 crushed 2,000 but less than 5,000 tons, 8 crushed 5,000 but less than 10,000 tons, and 7 crushed 10,000 tons and over.

**Textiles.**—The growth of the textile industry, as a whole, is shown by the increase in the number of spindles, looms, and knitting machines. In the next table the number of each of the principal kinds of machines used at the last three censuses is shown.

MACHINE.	Cen- sus.	Total.	Cotton goods, including cotton small wares.	Hosiery and knit goods.	Woolen, worsted, and felt goods, and wool hats.
Producing spindles.....	1909	286,506	225,638	11,892	48,076
	1904	200,047	153,375	.....	46,672
	1899	161,921	123,896	.....	38,035
Looms.....	1909	5,143	4,233	.....	860
	1904	4,086	3,008	.....	1,078
	1899	4,234	2,995	.....	1,239
Knitting machines.....	1909	3,929	.....	3,929	.....
	1904	1,787	.....	1,787	.....
	1899	581	.....	581	.....
Woolen cards (sets).....	1909	82	.....	.....	82
	1904	82	.....	.....	82
	1899	99	.....	.....	99

The total number of producing spindles shows an increase from 1904 to 1909 of 86,459, or 43.2 per cent; of looms, an increase of 1,057, or 25.9 per cent; and of knitting machines, an increase of 2,142, or 119.9 per cent; while the number of woolen cards was the same for both years. In the cotton mills, where 78.8 per cent of the spindles and 83.3 per cent of the looms were used in 1909, the rates of increase for both kinds of machines were much greater from 1904 to 1909 than during the previous five years.

**Cotton goods, including cotton small wares.**—The manufacture of cotton goods is the most important of the textile industries in Tennessee, and shows a decided growth from census to census. The quantity and cost of the materials used, and the kind and value of the products reported at the last three censuses are given below:

MATERIAL OR PRODUCT.	1909	1904	1899
<b>Materials used, total cost.....</b>	<b>\$3,343,672</b>	<b>\$2,240,973</b>	<b>\$1,143,234</b>
Cotton:			
Pounds.....	28,312,077	10,292,275	15,040,336
Cost.....	\$2,941,040	\$2,045,800	\$984,300
Starch.....	\$8,085	\$10,554	\$6,000
Fuel and rent of power.....	\$103,111	\$55,654	\$39,823
All other materials.....	\$201,430	\$123,905	\$112,109
<b>Products, total value.....</b>	<b>\$5,200,791</b>	<b>\$3,560,934</b>	<b>\$1,994,935</b>
Brown or bleached sheetings and shirtings:			
Square yards.....	7,696,680	6,184,888	11,012,570
Value.....	\$435,958	\$341,530	\$501,576
Yarns, for sale:			
Pounds.....	7,443,170	5,062,404	2,000,083
Value.....	\$1,378,605	\$992,200	\$263,662
Cotton waste, for sale:			
Pounds.....	2,164,304	2,263,961	1,150,009
Value.....	\$56,954	\$84,322	\$22,769
All other products.....	\$3,320,184	\$2,142,872	\$1,206,028

In 1909, 28,312,077 pounds of cotton, all domestic, costing \$2,941,046, were consumed in this industry. This was an increase of 9,019,802 pounds, or 46.8 per cent, in quantity and of \$895,246, or 43.8 per cent, in cost over the figures for 1904. The industry shows a gain of 46 per cent in value of products from 1904 to 1909, as against a gain of 78.5 per cent from 1899 to 1904. The increase in value of products from 1904 to 1909 was due principally to the increase in the value of the cotton yarn produced for sale and the value of the products included under the head of "All other products." The principal items included under the latter

head are plain cloths for printing or converting, drills and duck. They are not shown separately, as to do so would disclose the output of individual establishments.

Both the quantity and the value of the output of brown or bleached sheetings and shirtings show increases over the figures for 1904, but the increases have not been large enough to counterbalance the decreases which took place from 1899 to 1904. While the quantity of yarn produced for sale in 1909 was 2,380,676 pounds, or 47 per cent, greater than in 1904 and their value \$386,435, or 38.9 per cent, greater, the increase was not as great as during the earlier five-year period when the increase in quantity was 153.1 and that in value 276.3 per cent.

**Hosiery and knit goods.**—The following tabular statement shows the quantity and cost of the different kinds of materials used and the quantity and value of the various products of the industry during the last three census years:

MATERIAL OR PRODUCT.	1909	1904	1899
<b>Materials used, total cost.....</b>	<b>\$2,120,225</b>	<b>\$969,196</b>	<b>\$248,050</b>
Cotton yarn purchased:			
Pounds.....	4,746,086	4,701,653	1,090,000
Cost.....	\$1,203,887	\$841,092	\$203,500
Chemicals and dyestuffs.....	\$121,614	\$40,915	\$21,500
Fuel and rent of power.....	\$42,916	\$18,146	\$1,600
All other materials.....	\$761,808	\$69,043	\$22,350
<b>Products, total value.....</b>	<b>\$3,565,436</b>	<b>\$1,627,323</b>	<b>\$395,150</b>
Hose:			
Dozens.....	2,420,817	1,155,692	183,500
Value.....	\$2,075,719	\$917,233	\$192,150
Half hose:			
Dozens.....	846,339	659,754	360,000
Value.....	\$770,547	\$368,792	\$203,000
All other products.....	\$719,170	\$341,798	.....

Cotton yarn purchased formed over four-fifths of the total cost of materials used in 1899 and 1904, but in 1909, when a few of the mills purchased the raw cotton and spun their own yarn, the cost of cotton yarn purchased formed less than three-fifths of the total.

From 1904 to 1909 the value of hose manufactured increased 126.3 per cent and that of half hose 108.9 per cent, while the output of the former increased 109.5 per cent and the output of the latter only 28.3 per cent. The average value of hose per dozen dropped from \$1.05 in 1899 to 79 cents in 1904, but advanced to 86 cents in 1909. The average value per dozen of half hose, on the other hand, advanced from 56 cents in 1899 and 1904 to 91 cents in 1909. In 1909 three establishments were engaged in manufacturing knit underwear, and although a large increase was shown in the value of products in 1909 as compared with 1904 the statistics are included under "All other products" in the table in order to avoid disclosing the operations of individual establishments.

**Woolen goods.**—With respect to value of products this industry is less important than either cotton goods or hosiery and knit goods. The larger part of the output is woolen goods for men's wear woven on cotton warp. The title of this industry, being uniform for all states, is "Woolen, worsted, and felt goods, and wool hats," but in Tennessee only woolen goods are made.

Iron and steel, blast furnaces.—The following is a tabular statement showing the quantity and value of products for 1909, 1904, and 1899:

PRODUCT.	1909	1904	1899
<b>Total value</b> .....	\$4,653,125	\$3,428,049	\$4,693,215
Pig iron:			
Tons.....	333,416	303,624	374,249
Value.....	\$4,644,667	\$3,426,932	\$4,693,215
<i>Classified by grades.</i>			
Foundry..... tons..	271,562	247,368	287,655
Forge or mill..... tons..	12,693	24,957	54,182
All other, including low phosphorus, Bessemer, ferro-silicon, ferro-phosphorus, white and mottled, and miscellaneous, and direct castings..... tons..	49,161	31,290	32,412
All other products.....	\$8,458	\$1,117	

This industry has been built up in the state by the working of the abundant deposits of ore and fuel found there. The value of products in 1909 was practically the same as in 1899, although from 1899 to 1904 there was a decrease of 27 per cent, due to the general business depression prevailing in 1904. The table shows a large decrease in that grade of pig iron classified as forge or mill. The average value per ton of pig iron was \$12.54 in 1899, \$11.29 in 1904, and \$13.93 in 1909.

Fertilizers.—The following tabular statement gives the quantity and value of products reported for this industry at the censuses of 1909, 1904, and 1899:

PRODUCT.	1909	1904	1899
<b>Total value</b> .....	\$3,249,343	\$2,700,561	\$1,466,288
Superphosphates from minerals, bones, etc.:			
Tons.....	25,322	20,410	35,959
Value.....	\$244,278	\$308,284	\$450,568
Complete fertilizers:			
Tons.....	130,343	83,370	36,605
Value.....	\$2,776,372	\$1,596,764	\$704,220
Other fertilizers:			
Tons.....	14,601	45,707	20,400
Value.....	\$213,464	\$755,964	\$304,000
Sulphuric acid:			
Tons.....	806	5,000	
Value.....	\$5,197	\$30,000	
All other products.....	\$10,032	\$0,549	\$1,500

Complete fertilizers formed the largest single product at each census. Their value from census to census has composed an increasing proportion of the total value of products for the industry, and in 1909 formed more than five-sixths of this total. Superphosphates from minerals, and "other fertilizers" show decreases both in quantity and in value during the period 1904-1909, the principal cause of which is the more general use in this industry in Tennessee of phosphate rock, pyrites, and kainit. The quantity and value of sulphuric acid sold in 1909 was only about one-sixth of that sold in 1904.

Laundries.—Statistics for steam laundries are not included in the general tables, or in the totals for manufacturing industries. In 1909 there were 63 such establishments in the state of Tennessee, 10 of which were in Nashville, 8 in Memphis, 7 in Knoxville, 6 in Chattanooga, and 3 in Jackson.

The three most common forms of ownership—the individual, firm, and corporate—were about equally represented in the industry, the first two reporting 22 establishments each and the corporate form 19 establishments. Twelve establishments had receipts for the year's business of less than \$5,000; 29, \$5,000 but

less than \$20,000; 19, \$20,000 but less than \$100,000; and 3, receipts in excess of \$100,000.

The following statement summarizes the statistics:

Number of establishments.....	63
Persons engaged in the industry.....	2,392
Proprietors and firm members.....	68
Salaried employees.....	175
Wage earners (average number).....	2,149
Primary horsepower.....	1,863
Capital.....	\$1,283,583
Expenses.....	1,340,732
Services.....	811,213
Materials.....	297,691
Miscellaneous.....	231,828
Amount received for work done.....	1,643,407

The average number of wage earners employed each month and the percentage which this number represented of the greatest number employed in any one month were as follows:

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent. of maximum.		Number.	Per cent. of maximum.
January.....	2,041	90.9	July.....	2,236	90.6
February.....	2,030	90.8	August.....	2,246	100.0
March.....	2,050	91.7	September.....	2,183	97.2
April.....	2,130	94.8	October.....	2,189	97.5
May.....	2,117	94.3	November.....	2,171	96.7
June.....	2,100	97.8	December.....	2,177	96.9

The different kinds of primary power, the number of engines or motors, and the horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines or motors.	Horsepower.
<b>Primary power, total</b> .....		1,863
Owned:		
Steam.....	64	1,707
Gas.....	1	5
Rented—Electric.....	39	61

The kind and amount of fuel used are shown in the following statement:

KIND.	Unit.	Quantity.
Bituminous coal.....	Tons.....	20,395
Coke.....	Tons.....	313
Wood.....	Cords.....	12
Oil.....	Barrels.....	94
Gas.....	1,000 feet.....	9,108

Custom sawmills and gristmills.—Statistics for custom sawmills and gristmills are not included in the general tables or in the totals for manufacturing industries, but are presented in the following summary:

	Custom sawmills.	Custom gristmills.
Number of establishments.....	226	1,068
Persons engaged in industry.....	918	1,938
Proprietors and firm members.....	321	1,403
Salaried employees.....	3	2
Wage earners (average number).....	594	533
Primary horsepower.....	4,475	16,587
Capital.....	\$237,331	\$967,643
Expenses.....	108,017	2,295,827
Services.....	87,980	55,368
Materials.....	6,027	12,210,809
Miscellaneous.....	14,030	27,650
Value of products.....	233,204	12,648,200

<sup>1</sup> Includes estimate of all grain ground. A similar estimate for value of lumber sawed by custom sawmills is impracticable.

MANUFACTURES—TENNESSEE.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.  
THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaries and employes.	Wage earners (average number).							
			Expressed in thousands.										
<b>STATE—All industries.....</b>	1909 1904 1899	4,600 3,175 3,118	87,672 69,287 60,287	5,415 3,805 3,805	8,417 4,910 3,329	73,840 175,780 45,963	242,277 175,780 130,318	\$167,924 102,439 63,141	\$9,186 5,080 3,048	\$28,252 22,806 14,728	\$104,016 79,352 54,559	\$180,217 137,960 92,749	\$76,201 58,608 38,189
Agricultural implements.....	1909 1904 1899	16 12 11	712 656 422	9 9 11	58 34 38	645 613 373	1,236 757 568	1,466 80 418	80 51 35	268 216 113	413 314 202	1,004 769 403	321 455 261
Boots and shoes, including cut stock and findings.	1909 1904 1899	4 4 1	427 246 1	7 5 1	46 16 1	374 225 1	174 200 1	532 174 1	70 10 1	118 78 1	827 640 1	1,181 837 1	354 197 1
Boxes, fancy and paper.....	1909 1904 1899	6 6 6	227 201 196	3 3 7	22 11 15	202 187 174	114 70 64	148 84 64	27 9 11	58 46 33	122 104 63	258 196 132	136 92 69
Bread and other bakery products.....	1909 1904 1899	131 81 76	1,179 767 531	150 95 96	174 69 75	855 603 360	645 316 666	1,260 1,294 666	132 58 37	376 237 158	1,700 1,021 683	2,822 1,974 1,403	1,162 654 429
Brick and tile.....	1909 1904 1899	91 84 91	1,487 1,410 1,307	112 108 121	94 68 34	1,281 1,234 1,152	4,631 3,165 2,821	1,868 1,200 891	82 65 31	443 378 293	346 295 166	1,308 1,100 685	962 805 519
Canning and preserving.....	1909 1904 1899	37 16 11	375 231 151	45 16 19	27 12 16	303 263 116	450 360 75	274 90 36	11 10 2	30 151 15	131 151 38	206 242 72	75 59 35
Carriages and wagons and materials.....	1909 1904 1899	120 97 95	1,992 2,148 1,992	150 109 77	136 150 77	1,706 1,889 1,157	4,537 4,408 1,138	3,006 2,617 1,138	160 158 71	693 750 305	1,439 1,668 780	3,040 3,278 1,692	1,663 1,619 912
Cars and general shop construction and repairs by steam-railroad companies.	1909 1904 1899	17 16 16	5,884 4,939 2,882	318 179 65	5,566 4,760 2,817	5,145 1,904 1,341	4,035 2,029 1,320	320 173 59	3,252 2,017 1,450	3,116 2,078 1,528	6,777 5,839 3,113	3,601 2,563 1,682	
Clothing, men's, including shirts.....	1909 1904 1899	34 32 31	1,892 2,154 1,892	34 44 81	262 142 1,584	1,596 1,968 1,584	503 656 839	2,257 1,324 839	309 153 74	402 413 350	2,123 1,877 1,019	3,301 3,069 1,760	1,258 1,192 744
Coffins, burial cases, and undertakers' goods.....	1909 1904 1899	8 8 10	570 482 342	90 52 3	480 430 287	976 712 440	1,138 864 440	130 83 68	201 185 118	522 349 329	1,189 923 625	1,189 923 625	167 254 200
Coke.....	1909 1904 1899	8 9 8	270 416 499	20 39 22	250 377 477	370 495 605	858 733 607	14 24 14	87 129 128	478 611 523	586 810 765	168 199 232	
Confectionery.....	1909 1904 1899	31 25 16	1,086 695 68	23 19 68	160 116 337	894 560 313	1,154 313 372	1,504 181 640	177 100 54	276 181 101	1,657 901 424	2,520 1,873 814	863 912 561
Cooperage and wooden goods, not elsewhere specified.	1909 1904 1899	19 25 34	913 424 13	18 29 13	39 19 539	850 376 539	2,209 884 230	1,443 346 230	50 19 13	253 134 170	629 481 277	1,148 792 472	519 241 255
Copper, tin, and sheet-iron products.....	1909 1904 1899	57 35 24	704 404 10	73 49 10	59 32 224	572 383 150	154 150 207	673 299 207	70 25 13	201 204 86	593 435 157	1,229 871 352	1,000 400 100
Cotton goods, including cotton small wares.....	1909 1904 1899	17 16 17	3,164 2,362 2,158	3 2 3	83 60 47	3,078 2,294 2,108	11,129 8,901 5,625	7,454 5,113 3,768	105 80 54	867 2,241 423	3,344 2,241 1,143	5,201 3,661 1,996	1,507 1,309 822
Fertilizers.....	1909 1904 1899	12 10 5	670 854 492	12 6 4	90 67 45	559 781 443	2,152 1,970 950	4,106 3,381 950	137 98 40	204 210 94	2,122 1,712 790	3,249 2,791 1,466	1,117 909 656
Flour-mill and gristmill products.....	1909 1904 1899	454 387 362	2,658 2,429 2,17	663 584 217	418 250 1,055	1,577 1,595 1,055	27,176 23,441 4,997	8,511 6,927 4,997	323 212 192	559 601 590	25,286 21,912 16,323	29,070 25,351 19,161	3,784 3,639 2,808
Foundry and machine-shop products.....	1909 1904 1899	124 100 104	4,094 3,716 104	102 85 182	551 318 3,353	4,041 5,295 3,353	7,488 5,295 3,817	9,253 4,616 3,817	695 345 107	2,006 1,482 1,208	4,560 2,854 2,284	9,190 6,124 4,043	4,639 3,276 2,359
Furniture and refrigerators.....	1909 1904 1899	42 40 20	2,667 2,781 20	15 25 75	233 149 1,068	2,419 3,623 1,068	3,758 3,623 1,068	3,497 2,780 1,068	258 158 71	807 923 318	1,448 1,409 653	3,300 3,238 1,188	1,561 1,509 505
Gas, illuminating and heating.....	1909 1904 1899	11 11 11	530 412 267	4 4 40	104 50 218	422 358 218	613 624 2,304	9,370 2,185 2,304	98 58 41	164 127 65	357 204 135	1,282 830 572	300 628 400
Hosiery and knit goods.....	1909 1904 1899	22 16 4	3,229 1,855 523	2 4 12	110 41 611	3,117 1,952 212	2,758 1,052 212	3,055 1,160 217	125 21 16	724 341 73	2,120 909 249	3,665 1,928 395	2,443 659 406
Ice, manufactured.....	1909 1904 1899	57 37 27	986 487 472	46 26 20	161 79 70	779 382 385	9,327 9,812 3,589	2,748 1,125 1,104	154 67 50	362 101 177	261 123 110	1,324 684 538	1,065 561 408
Iron and steel, blast furnaces.....	1909 1904 1899	13 13 13	1,268 1,480 1,845	125 128 81	1,143 1,368 1,768	18,150 21,011 18,350	7,122 5,688 5,252	147 128 103	510 128 459	3,381 2,006 3,100	4,653 3,428 4,693	1,222 819 1,224	

<sup>1</sup> Figures can not be shown without disclosing individual operations.  
<sup>2</sup> Excluding statistics for two establishments, to avoid disclosure of individual operations.

MANUFACTURES—TENNESSEE.

19

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaries employees.	Wage earners (average number).							
Expressed in thousands.													
<b>STATE—Continued.</b>													
Leather goods.....	1909	47	808	47	157	604	344	\$1,419	\$141	\$243	\$1,313	\$2,139	\$826
	1904	36	852	32	91	729	208	921	87	258	966	1,787	821
	1899	34	.....	.....	60	533	.....	540	51	198	653	1,122	469
Leather, tanned, curried, and finished.....	1909	25	463	26	42	305	1,684	3,564	50	130	1,994	2,530	536
	1904	29	804	28	40	736	1,731	4,013	64	252	2,851	3,684	733
	1899	44	887	55	29	803	804	3,444	35	240	2,184	2,802	618
Lime.....	1909	20	461	19	27	415	668	282	30	130	93	323	230
	1904	17	456	22	18	416	605	278	18	118	121	326	205
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Liquors, distilled.....	1909	39	239	40	45	154	1,205	1,308	44	53	305	2,256	1,861
	1904	50	207	60	15	132	803	882	17	55	256	568	312
	1899	51	205	55	11	139	700	500	8	43	200	940	740
Liquors, malt.....	1909	5	450	2	56	392	3,005	2,263	122	238	653	2,044	1,391
	1904	4	408	1	50	357	1,774	2,339	94	102	437	1,832	1,395
	1899	4	320	1	31	288	1,270	1,278	52	130	262	1,175	913
Lumber and timber products.....	1909	1,977	26,283	2,683	1,211	23,389	83,382	30,169	1,325	6,966	13,641	30,457	16,816
	1904	1,122	10,705	1,605	823	17,277	52,831	20,431	800	6,456	11,590	26,864	15,274
	1899	1,204	.....	.....	510	14,300	.....	11,056	418	4,380	9,327	10,166	9,830
Marble and stone work.....	1909	81	1,180	88	95	1,006	2,781	1,476	88	515	480	1,465	985
	1904	32	750	40	20	681	1,204	648	30	331	339	944	605
	1899	54	.....	.....	68	685	.....	600	36	241	215	845	630
Mattresses and spring beds.....	1909	17	352	20	60	272	1,000	513	52	104	362	656	294
	1904	12	270	21	21	237	217	212	17	72	216	436	220
	1899	10	.....	.....	14	107	.....	81	10	32	181	263	82
Millinery and lace goods.....	1909	6	154	8	54	92	4	56	20	26	101	202	101
	1904	4	81	6	2	73	5	37	1	27	101	181	80
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oil, cottonseed, and cake.....	1909	29	957	4	147	800	7,472	3,731	202	290	5,201	6,593	1,392
	1904	20	819	.....	118	701	6,606	2,914	138	246	3,084	3,744	660
	1899	17	833	2	80	761	4,460	1,997	105	204	2,278	2,980	702
Paint and varnish.....	1909	0	117	1	45	71	1,045	408	52	37	238	397	159
	1904	4	91	1	14	76	295	224	25	30	288	481	193
	1899	5	56	3	8	45	122	74	11	18	89	151	62
Patent medicines and compounds and druggists' preparations.....	1909	76	998	52	513	433	418	2,225	535	148	1,341	3,515	2,174
	1904	<sup>a</sup> 47	739	28	222	489	364	1,317	228	143	901	2,789	1,888
	1899	<sup>a</sup> 28	.....	.....	115	399	.....	730	137	138	525	1,504	979
Pottery, terra-cotta, and fire-clay products.....	1909	6	354	3	28	323	678	357	32	126	110	328	218
	1904	8	318	7	14	297	535	186	19	128	79	309	230
	1899	18	330	15	15	300	577	172	12	91	74	260	186
Printing and publishing.....	1909	413	4,442	443	1,085	2,914	2,995	6,493	1,085	1,701	1,954	7,173	5,219
	1904	340	3,373	386	857	2,330	1,913	4,415	667	1,323	1,323	5,091	3,768
	1899	<sup>a</sup> 284	.....	.....	500	1,788	.....	3,602	432	821	882	3,455	2,573
Slaughtering and meat packing.....	1909	27	379	<sup>a</sup> 31	68	280	1,242	2,516	61	140	1,610	2,057	447
	1904	<sup>a</sup> 12	81	13	9	59	936	408	9	23	275	377	192
	1899	13	.....	.....	15	166	.....	680	17	66	1,480	1,712	233
Stoves and furnaces, including gas and oil stoves.....	1909	17	1,242	7	150	1,085	1,380	1,827	140	519	717	1,951	1,234
	1904	10	870	7	53	819	830	1,158	60	404	349	1,116	767
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Woolen, worsted, and felt goods, and wool hats.....	1909	21	1,737	21	62	1,654	2,371	2,515	73	419	1,127	1,802	675
	1904	27	1,481	22	44	1,415	2,590	2,310	54	327	945	1,705	701
	1899	51	1,725	20	64	1,632	.....	2,400	68	294	874	1,517	643
All other industries.....	1909	466	9,463	440	1,174	7,840	25,094	31,144	1,445	3,430	15,601	26,787	11,186
	1904	321	6,349	304	806	5,430	16,410	14,314	639	1,995	9,343	15,797	6,454
	1899	301	.....	.....	456	3,526	.....	5,249	423	1,116	4,393	8,058	3,695

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

MEMPHIS—All industries.....	1909	329	9,937	597	1,413	7,927	21,320	\$26,868	\$1,727	\$4,288	\$17,851	\$30,242	\$12,391
	1904	289	8,448	269	805	7,374	.....	13,296	994	3,543	11,338	20,045	8,705
	1899	223	.....	.....	452	6,626	.....	8,767	552	2,792	7,879	14,233	6,354
Bread and other bakery products.....	1909	31	515	32	62	421	312	736	68	202	864	1,452	588
	1904	27	327	32	20	266	.....	528	29	113	440	787	341
	1899	21	216	24	35	157	.....	471	19	75	459	609	210
Carriages and wagons and materials.....	1909	16	421	14	33	374	714	952	48	200	386	882	490
	1904	15	520	8	33	479	.....	838	53	262	466	971	505
	1899	11	296	8	13	275	.....	403	20	113	206	452	240

<sup>1</sup> Not reported separately.

<sup>2</sup> Figures can not be shown without disclosing individual operations.

<sup>3</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.

<sup>4</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

## MANUFACTURES—TENNESSEE.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salariat employees.	Wage earners (average number).							
Expressed in thousands.													
<b>MEMPHIS—Continued.</b>													
Clothing, men's, including shirts.....	1909	7	58	7	5	46	27	\$62	\$6	\$16	\$75	\$163	\$88
	1904	9	240	16	27	197	.....	142	28	37	263	487	194
	1899	12	.....	.....	1	428	.....	213	2	120	274	528	254
Confectionery.....	1909	9	373	4	72	297	62	422	75	123	830	1,128	268
	1904	7	218	2	30	186	.....	206	30	82	442	840	407
	1899	4	.....	.....	5	57	.....	45	4	22	88	147	59
Cooperage and wooden goods, not elsewhere specified.	1909	4	428	2	13	413	1,166	901	20	123	310	557	247
	1904	5	223	4	8	211	.....	202	10	80	269	379	110
	1899	3	70	3	4	72	.....	20	4	39	80	162	66
Copper, tin, and sheet-iron products.....	1909	14	140	19	7	114	5	130	7	68	111	242	131
	1904	11	125	16	.....	109	.....	85	.....	77	129	292	161
	1899	7	.....	.....	.....	60	.....	30	.....	32	34	110	76
Foundry and machine-shop products.....	1909	18	519	12	70	437	1,557	1,086	82	284	565	1,130	565
	1904	15	512	13	53	446	.....	743	68	256	372	881	509
	1899	15	897	20	23	764	.....	1,071	33	351	490	1,079	583
Ice, manufactured.....	1909	6	308	1	35	272	1,726	842	48	154	80	405	415
	1904	4	210	.....	31	170	.....	437	32	110	40	310	270
	1899	4	217	.....	25	102	.....	545	31	103	45	290	215
Leather goods.....	1909	9	96	8	24	64	54	147	17	39	151	262	111
	1904	5	69	4	5	60	.....	71	6	27	116	171	55
	1899	5	.....	.....	.....	110	.....	183	.....	60	159	278	119
Lumber and timber products.....	1909	18	1,288	17	145	1,126	3,250	2,855	220	563	1,504	2,830	1,326
	1904	16	1,041	11	85	945	.....	1,872	111	421	1,059	1,917	858
	1899	20	.....	.....	73	1,625	.....	1,984	96	599	1,237	2,468	1,264
Marble and stone work.....	1909	8	122	11	4	107	125	139	3	84	53	216	163
	1904	3	110	5	3	102	.....	121	2	61	36	121	85
	1899	4	83	6	1	76	.....	101	1	46	43	187	144
Oil, cottonseed, and cake.....	1909	9	500	4	77	419	3,962	2,261	117	161	3,509	4,316	897
	1904	11	559	.....	74	485	.....	2,196	101	181	2,261	2,681	430
	1899	9	636	.....	40	587	.....	1,550	72	159	1,821	2,271	450
Patent medicine and compounds and druggists' preparations.	1909	21	146	15	61	70	17	304	47	20	360	639	279
	1904	8	58	4	12	42	.....	128	10	14	174	374	200
	1899	5	48	6	9	33	.....	72	18	14	78	226	148
Printing and publishing.....	1909	45	815	68	231	516	622	1,183	242	407	520	1,793	1,273
	1904	46	640	61	156	423	.....	668	100	278	382	1,322	910
	1899	27	432	20	78	325	.....	441	90	173	208	776	508
All other industries.....	1909	114	4,208	383	574	3,251	7,721	14,948	727	1,835	8,533	14,137	5,604
	1904	107	3,596	93	259	3,244	.....	4,969	324	1,544	4,853	8,591	3,648
	1899	76	.....	.....	136	1,866	.....	2,629	162	868	2,645	4,600	1,955
<b>NASHVILLE—All industries.....</b>													
	1909	384	11,888	368	1,794	9,721	19,538	\$27,880	\$1,862	\$4,836	\$17,456	\$20,650	\$12,194
	1904	287	9,866	255	1,099	8,032	.....	15,601	1,110	3,224	12,482	21,567	9,085
	1899	237	.....	.....	911	8,728	.....	11,874	786	2,276	9,027	15,301	6,274
Bread and other bakery products.....	1909	23	122	25	10	87	65	83	10	49	203	316	133
	1904	14	157	16	22	119	.....	533	17	45	204	586	378
	1899	16	119	19	27	73	.....	77	12	36	91	169	78
Carriages and wagons and materials.....	1909	17	226	22	11	193	148	131	12	96	158	337	179
	1904	11	202	14	20	168	.....	105	15	81	160	319	150
	1899	9	.....	.....	5	111	.....	73	5	47	65	166	101
Cars and general shop construction and repairs by steam-railroad companies.	1909	3	1,388	.....	60	1,328	630	1,012	68	707	678	1,576	896
	1904	3	1,466	.....	39	1,427	.....	619	47	743	890	1,724	814
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clothing, men's, including shirts.....	1909	5	466	12	56	398	127	445	73	112	522	836	314
	1904	7	594	18	48	528	.....	364	53	121	424	708	344
	1899	8	518	15	37	466	.....	275	31	90	367	504	227
Confectionery.....	1909	11	334	10	41	283	131	324	35	63	315	454	159
	1904	9	267	7	65	195	.....	203	52	50	243	583	345
	1899	5	.....	.....	55	166	.....	276	42	49	262	425	223
Cooperage and wooden goods, not elsewhere specified.	1909	4	96	3	9	84	150	98	10	34	130	190	51
	1904	5	86	2	5	70	.....	75	5	31	164	216	52
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Copper, tin, and sheet-iron products.....	1909	12	96	16	12	68	16	115	8	30	75	160	85
	1904	4	67	3	5	59	.....	45	4	37	44	114	59
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Flour-mill and gristmill products.....	1909	10	309	16	50	243	2,227	947	51	89	4,888	5,710	831
	1904	4	216	2	36	178	.....	752	41	86	3,600	4,242	582
	1899	4	225	2	45	178	.....	922	47	91	3,424	3,907	483
Foundry and machine-shop products.....	1909	11	179	15	22	142	193	252	24	80	114	280	166
	1904	9	190	10	18	162	.....	235	19	83	143	298	155
	1899	13	172	18	13	141	.....	113	12	60	82	222	149

1 Excluding statistics for one establishment, to avoid disclosure of individual operations.

2 Excluding statistics for two establishments, to avoid disclosure of individual operations.

3 Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

4 Figures can not be shown without disclosing individual operations.

MANUFACTURES - TENNESSEE.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY AND CITY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaries employees.	Wage earners (average number).							
Expressed in thousands.													
<b>NASHVILLE—Continued.</b>													
Furniture and refrigerators.....	1909	5	522	1	45	478	403	\$763	\$49	\$204	\$248	\$673	\$425
	1904	0	493	4	31	468		462	33	190	289	639	350
	1899												
Ice, manufactured.....	1909	4	170		23	153	1,795	354	27	66	67	233	160
	1904	3	63	1	9	53		129	9	25	33	120	87
	1899	4	97	4	14	70		195	11	33	28	112	84
Leather goods.....	1909	11	271	14	75	182	93	617	67	86	508	780	281
	1904	7	252	7	36	209		303	31	76	330	564	234
	1899	13			45	208		237	37	66	292	475	183
Lumber and timber products.....	1909	25	1,372	28	100	1,244	3,352	3,052	117	547	1,539	2,673	1,134
	1904	19	1,125	29	81	1,015		1,545	73	358	1,035	2,418	783
	1899	13	1,182	23	47	1,112		1,180	44	308	837	1,633	706
Mattresses and spring beds.....	1909	4	95	3	21	71	111	130	15	27	103	187	84
	1904	3	58	10	6	42		35	4	14	70	130	80
	1899	3	50	8	5	37		29	4	11	61	89	28
Patent medicines and compounds and druggists' preparations.....	1909	1-1	81	10	41	30	13	208	35	10	82	205	124
	1904	7	83	2	40	41		172	41	10	110	280	170
	1899	3	47	5	14	28		57	14	7	71	123	52
Printing and publishing.....	1909	80	1,875	61	579	1,235	1,227	3,594	603	728	896	3,285	2,389
	1904	54	1,426	41	340	1,045		2,543	344	552	591	2,292	1,701
	1899	52	1,066	44	291	731		2,115	240	371	421	1,628	1,207
All other industries.....	1909	130	4,275	132	639	3,504	8,788	15,755	658	1,318	6,021	11,716	4,795
	1904	92	2,641	89	298	2,254		7,481	322	713	3,444	6,274	2,830
	1899	94			313	3,396		6,325	281	1,029	3,080	5,758	2,672

CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES COMBINED.

Chattanooga.....	1909	185	7,507	125	972	6,410	17,509	\$16,125	\$1,180	\$2,816	\$8,434	\$16,036	\$7,602
	1904	177	7,236	130	686	6,420		10,394	719	2,564	7,474	14,201	6,787
	1899	140			468	4,729		7,459	417	1,016	6,421	10,518	4,097
Jackson.....	1909	42	1,613	28	180	1,405	2,789	2,236	193	673	1,215	2,710	1,495
	1904	42	1,421	35	118	1,208		1,519	112	498	1,183	2,318	1,135
	1899	33			101	1,018		980	78	400	698	1,577	884
Knoxville.....	1909	159	3,464	141	550	2,773	6,001	5,333	552	1,078	5,101	9,140	3,048
	1904	138	3,420	128	293	2,909		3,744	275	1,048	4,101	6,699	2,598
	1899	102			240	4,203		5,036	242	1,288	3,552	6,202	2,650

<sup>1</sup> Figures can not be shown without disclosing individual operations.

<sup>2</sup> Excluding statistics for two establishments, to avoid disclosure of individual operations.

<sup>3</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.

<sup>4</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

MANUFACTURES—TENNESSEE.

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Primary horse-power.	
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners.				Total.	16 and over.		Under 16.				
					Male.	Female.	Average number.	Number.		Male.		Female.	Male.	Female.				
								Maximum month.	Minimum month.									
1 All industries.....	4,609	87,672	5,415	2,978	4,377	1,062	73,840	No	80,676	Ja	69,305	(1)	(1)	(1)	(1)	(1)	242,277	
2 Agricultural implements.....	10	712	9	26	22	10	645	De	743	My	567	761	745	4	12	.....	1,236	
3 Artificial stone.....	20	155	33	6	1	.....	115	Jy	155	Ja	57	142	140	2	.....	.....	51	
4 Bags, other than paper.....	5	404	5	13	33	8	405	No	492	My	345	436	151	242	22	21	576	
5 Belting and hose, leather.....	3	28	6	1	2	2	17	Je	19	Fe	15	17	17	.....	.....	.....	39	
6 Boots and shoes, including cut stock and findings.....	4	427	7	9	35	2	374	Jy	385	Fe	358	383	252	86	34	11	174	
7 Boxes, fancy and paper.....	6	227	3	11	7	4	202	No	222	Ja	184	238	90	144	.....	4	114	
8 Brass and bronze products.....	9	40	10	2	1	25	25	No	30	Ap	17	30	30	.....	.....	.....	43	
9 Bread and other bakery products.....	131	1,179	150	25	112	37	855	De	967	My	797	975	701	25-1	17	3	645	
10 Brick and tile.....	91	1,487	112	57	32	5	1,281	Jy	1,740	Fe	652	1,754	1,064	1	89	.....	4,631	
11 Brooms.....	29	173	40	8	2	1	122	No	148	My	102	152	120	25	5	2	82	
12 Buttons.....	5	76	6	1	.....	.....	69	No	128	Ja	24	123	119	4	.....	.....	84	
13 Canning and preserving.....	37	375	45	21	6	.....	303	Au	1,411	Mh	3	1,423	430	787	91	115	450	
14 Carriages and wagons and materials.....	129	1,992	150	82	38	16	1,706	No	1,833	Ja	1,555	1,892	1,875	4	13	.....	4,537	
15 Cars and general shop construction and repairs by steam-railroad construction companies.....	17	5,884	.....	81	231	6	5,566	De	6,081	My	5,197	6,007	6,051	15	1	.....	5,145	
16 Cars and general shop construction and repairs by street-railroad companies.....	6	283	.....	6	10	1	266	De	283	Fe	252	283	279	4	.....	.....	504	
17 Cars, steam-railroad, not including operations of railroad companies.....	3	1,170	.....	22	42	2	1,104	No	1,588	My	504	1,539	1,539	.....	.....	.....	1,400	
18 Clothing, men's, including shirts.....	34	1,892	34	66	176	20	1,596	Ja	1,775	Oc	1,460	1,772	341	1,401	.....	30	593	
19 Coffins, burial cases, and undertakers' goods.....	8	570	.....	24	59	7	480	Fe	487	No	472	480	448	32	.....	.....	976	
20 Coke.....	8	270	.....	9	11	.....	250	No	325	Jy	205	322	322	.....	.....	.....	370	
21 Confectionery.....	31	1,086	23	40	108	21	894	No	1,083	Ja	708	1,073	550	511	7	5	1,154	
22 Cooperage and wooden goods, not elsewhere specified.....	19	913	18	20	16	3	856	De	1,032	My	685	1,047	898	120	26	3	2,209	
23 Copper, tin, and sheet-iron products.....	57	704	73	21	31	7	572	Au	674	Fe	389	653	614	16	16	7	154	
24 Cotton goods, including cotton small wares.....	17	3,164	3	48	31	4	3,078	My	3,120	Se	3,042	3,123	1,389	1,183	277	274	11,129	
25 Electrical machinery, apparatus, and supplies.....	5	118	.....	12	2	5	99	De	119	Je	88	119	90	28	1	.....	94	
26 Fertilizers.....	12	670	12	23	71	5	559	Mh	893	Je	372	517	517	.....	.....	.....	2,152	
27 Flour-mill and gristmill products.....	454	2,658	663	166	226	26	1,577	Au	1,661	Je	1,425	1,650	1,633	2	13	2	27,176	
28 Foundry and machine-shop products.....	124	4,694	102	200	281	70	4,041	No	4,517	Ja	3,655	4,513	4,452	8	53	.....	7,458	
29 Furnishing goods, men's.....	4	57	2	5	3	1	46	De	49	Mh	40	49	49	5	42	2	.....	
30 Furniture and refrigerators.....	42	2,667	15	107	95	31	2,419	De	2,694	Ja	2,232	2,696	2,405	75	156	.....	3,758	
31 Gas, illuminating and heating.....	11	530	4	24	67	13	422	De	514	Fe	373	515	515	.....	.....	.....	633	
32 Hosiery and knit goods.....	22	3,220	2	60	28	22	3,117	Ap	3,191	Mh	3,038	3,261	841	1,878	209	333	2,758	
33 Ice, manufactured.....	57	986	46	96	55	9	770	Jy	1,143	Ja	440	749	742	.....	7	.....	9,327	
34 Iron and steel, blast furnaces.....	13	1,268	.....	48	69	8	1,143	Ja	1,461	My	893	1,539	1,526	.....	13	.....	18,150	
35 Jewelry.....	5	37	6	4	7	1	19	Ja	19	Jy	19	19	19	.....	.....	.....	27	
36 Leather goods.....	47	808	47	73	68	16	604	De	657	My	558	657	585	29	43	.....	344	
37 Leather, tanned, curried, and finished.....	25	463	26	19	19	4	395	Mh	429	Se	369	388	388	.....	.....	.....	1,684	
38 Lime.....	20	461	19	20	5	2	415	Se	451	Ja	353	457	454	.....	3	.....	668	
39 Liquors, distilled.....	39	239	40	20	21	4	154	No	174	Jy	123	187	180	.....	.....	.....	1,205	
40 Liquors, malt.....	5	450	2	13	40	3	392	Jy	451	Fe	346	368	349	1	18	.....	3,005	
41 Lumber and timber products.....	1,977	26,283	2,633	623	504	84	22,380	No	25,462	Ja	20,620	28,003	28,032	182	373	16	83,382	
42 Marble and stone work.....	81	1,189	88	37	47	11	1,006	De	1,060	Ja	942	1,076	1,072	2	2	.....	2,781	
43 Mattresses and spring beds.....	17	352	20	30	19	11	272	No	329	Ap	219	325	257	65	3	.....	1,090	
44 Millinery and lace goods.....	6	154	8	12	21	21	92	Se	121	Je	54	71	9	62	.....	.....	4	
45 Models and patterns, not including paper patterns.....	0	24	8	2	.....	.....	12	De	16	Ap	11	16	16	.....	.....	.....	41	
46 Oil, cottonseed, and cake.....	20	957	4	53	89	5	808	No	1,394	Jy	180	1,407	1,405	2	.....	.....	7,472	
47 Paint and varnish.....	6	117	1	17	22	6	71	My	77	Ja	63	74	65	7	2	.....	1,045	
48 Patent medicines and compounds and druggists' preparations.....	76	998	52	85	276	152	433	De	520	Ja	399	532	220	309	2	1	.....	418
49 Photo-engraving.....	6	55	6	6	.....	3	40	No	46	Au	35	44	30	.....	5	.....	30	
50 Pottery, terra-cotta, and fire-clay products.....	6	354	3	6	21	1	323	Je	333	De	311	319	314	2	3	.....	678	
51 Printing and publishing.....	413	4,442	443	229	627	229	2,914	Se	3,011	Ja	2,799	3,043	2,339	614	88	2	2,965	
52 Saws.....	5	46	8	5	4	1	28	Jy	31	Mh	21	20	22	.....	.....	.....	106	
53 Slaughtering and meat packing.....	27	379	31	23	38	7	280	De	633	My	151	631	591	39	1	.....	1,242	
54 Stoves and furnaces, including gas and oil stoves.....	17	1,242	7	46	66	38	1,085	No	1,275	Ja	651	1,250	1,195	45	10	.....	1,380	
55 Surgical appliances and artificial limbs.....	3	7	3	.....	.....	.....	4	Ja	4	Jy	4	4	4	.....	.....	.....	3	
56 Woolen, worsted, and felt goods, and wool hats.....	21	1,737	21	27	30	5	1,654	Je	1,746	Ja	1,569	1,686	751	753	88	94	2,371	
57 All other industries.....	346	6,730	316	288	543	109	5,469	.....	.....	.....	.....	.....	.....	.....	.....	.....	22,017	

1 No figures given for reasons explained in the Introduction, page 2. See also discussion of wage earners on page 7.  
 2 Same number reported for one or more other months.  
 3 Same number reported for entire year.  
 4 All other industries embrace—

Automobiles, including bodies and parts.....	2	Clothing, women's.....	3	Fireworks.....	1
Awnings, tents, and sails.....	8	Coffee and spice, roasting and grinding.....	8	Flags, banners, regalia, society badges and emblems.....	1
Axle grease.....	1	Cordage and twine and jute and linen goods.....	1	Flavoring extracts.....	10
Babbitt metal and solder.....	2	Cordials and sirups.....	2	Food preparations.....	23
Baking powders and yeast.....	2	Cutlery and tools, not elsewhere specified.....	2	Gas and electric fixtures and lamps and reflectors.....	2
Blackening and cleaning and polishing preparations.....	3	Dyestuffs and extracts.....	6	Glass.....	1
Bluing.....	3	Electroplating.....	1	Glass, cutting, staining, and ornamenting.....	2
Carpets, rag.....	1	Engraving and dieinking.....	1	Grease and tallow.....	1
Cement.....	2	Explosives.....	2	Hair work.....	4
Charcoal.....	1	Fancy articles, not elsewhere specified.....	1	.....	.....

MANUFACTURES—TENNESSEE.

THE STATE, BY INDUSTRIES: 1909.

	Capital.	EXPENSES.										Value of products.	Value added by manufacture.
		Total.	Services.			Materials.		Miscellaneous.					
			Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.		
1	\$167,923,784	\$168,979,837	\$4,070,223	\$4,516,020	\$28,251,501	\$5,191,450	\$98,824,384	\$566,378	\$3,202,601	\$1,814,508	\$11,042,592	\$180,216,548	\$76,200,714
2	1,465,895	838,978	41,213	38,975	268,119	20,018	383,872	.....	11,440	340	66,001	1,003,747	590,857
3	84,353	109,045	5,600	5,600	38,117	564	57,354	568	433	.....	7,159	140,715	88,797
4	1,401,135	2,343,811	27,900	39,500	130,171	13,009	2,006,884	2,000	5,394	.....	57,543	2,290,992	210,430
5	52,488	68,055	1,500	4,031	9,903	630	49,480	810	237	.....	1,458	75,986	25,870
6	532,067	1,120,904	23,800	46,117	117,806	6,761	820,730	2,763	1,814	30,316	70,761	1,180,891	353,397
7	148,284	230,355	18,008	9,424	57,883	2,576	119,552	6,650	506	.....	21,750	257,501	135,373
8	69,933	67,113	2,040	1,080	18,619	2,697	33,632	700	254	1,200	5,595	82,372	40,043
9	1,250,877	2,519,781	46,677	85,782	375,826	45,009	1,743,983	40,034	8,507	150	163,243	2,891,821	1,102,219
10	1,807,654	1,051,018	53,892	28,435	443,259	237,908	108,521	14,524	0,272	40,715	110,202	1,307,826	962,207
11	90,169	224,006	7,775	1,787	42,829	1,778	150,934	4,557	.....	.....	8,132	270,297	111,585
12	35,300	40,423	360	.....	28,703	1,173	13,739	750	30	1,020	588	48,895	33,923
13	274,622	100,526	8,995	1,848	39,276	2,671	127,982	661	959	550	7,554	209,098	75,415
14	3,005,864	2,541,308	114,980	44,563	693,307	22,549	1,410,877	22,021	15,893	40,313	170,805	3,039,613	1,600,187
15	4,034,678	6,776,511	132,648	196,000	3,251,658	103,680	3,011,853	.....	10,911	1	63,260	6,776,511	3,600,978
16	348,343	305,067	9,870	7,340	150,372	2,630	127,061	.....	6,485	.....	1,300	305,067	176,276
17	1,478,020	1,752,539	44,682	41,825	635,321	15,435	902,000	.....	5,148	.....	48,172	1,000,208	931,827
18	2,256,777	3,104,956	100,249	208,755	492,051	12,872	2,109,638	26,803	8,144	48,333	188,311	3,361,105	1,238,605
19	1,138,445	1,085,549	47,420	82,980	200,948	7,203	515,245	.....	6,382	.....	225,371	1,188,693	600,245
20	857,614	597,122	9,803	4,504	80,784	468,900	8,540	.....	3,558	.....	14,913	585,085	108,185
21	1,503,918	2,286,598	64,024	112,289	270,271	24,153	1,633,036	33,414	8,894	425	133,102	2,520,070	862,881
22	1,442,637	1,081,355	33,395	16,598	253,131	2,157	620,420	1,025	4,268	100	144,255	1,148,260	519,686
23	672,887	1,063,243	48,094	21,867	260,586	16,826	576,624	15,560	4,331	100	119,246	1,229,155	635,705
24	7,453,807	4,810,321	81,409	23,957	859,837	103,111	3,240,561	.....	32,270	444	477,732	5,290,791	1,857,119
25	117,598	131,814	23,038	3,500	32,764	2,040	40,788	840	548	.....	19,206	174,300	122,478
26	4,105,633	2,847,758	49,532	87,167	203,750	32,620	2,089,099	1,550	18,864	.....	365,177	3,249,343	1,127,615
27	8,510,635	27,190,073	176,865	145,712	559,242	108,628	25,087,218	15,912	48,224	2,394	955,858	29,070,019	3,784,153
28	9,252,940	8,049,889	382,104	313,030	2,006,383	244,753	4,315,447	22,441	49,349	40,380	666,093	9,189,791	4,629,691
29	73,720	113,660	7,000	1,812	14,232	528	72,700	800	507	.....	10,021	109,310	36,091
30	3,496,853	2,996,798	151,070	106,566	896,882	27,367	1,420,506	12,713	18,958	85,600	270,530	3,300,385	1,801,512
31	9,309,945	809,700	45,079	52,503	163,958	235,839	120,836	450	85,535	.....	105,600	1,281,558	924,883
32	3,054,790	3,265,867	83,171	41,530	723,756	42,916	2,077,309	4,740	8,893	46,021	236,721	3,505,436	1,445,211
33	2,747,094	1,028,451	109,988	43,527	362,167	180,814	91,224	235	28,293	.....	203,293	1,324,400	1,013,362
34	7,122,172	4,186,377	107,846	30,115	519,274	1,802,704	1,577,962	.....	22,922	310	116,244	4,663,125	1,272,450
35	51,122	75,319	4,700	5,200	14,027	1,101	40,993	5,086	637	.....	3,575	84,232	42,138
36	1,419,188	1,841,775	84,342	66,274	243,386	12,835	1,299,785	19,581	5,588	18,143	101,841	2,138,798	826,178
37	3,564,005	2,263,750	24,900	24,694	138,588	14,201	1,979,513	690	9,108	.....	72,146	2,529,901	530,187
38	281,010	226,755	24,123	5,460	120,281	45,812	47,631	1,080	3,887	71	20,571	323,307	229,864
39	1,398,202	1,877,346	31,912	11,935	53,400	20,062	368,658	1,145	1,350,357	.....	24,877	2,256,429	1,891,700
40	2,263,430	1,728,428	53,050	68,621	238,460	51,513	601,730	.....	265,030	500	449,524	2,043,723	1,300,480
41	30,158,572	24,892,523	848,872	476,445	6,965,997	100,419	13,541,622	38,664	114,292	1,085,650	1,721,162	30,450,807	16,815,306
42	1,475,940	1,200,090	54,155	33,965	514,812	34,250	440,070	9,408	5,984	7,601	94,436	1,465,246	984,017
43	512,761	564,616	31,090	21,119	103,960	9,072	353,307	7,401	2,013	.....	36,054	655,747	293,368
44	56,350	167,008	9,820	10,477	26,155	1,147	99,989	5,796	809	.....	12,875	201,058	100,822
45	12,124	15,771	1,700	173	8,933	148	2,938	911	32	.....	870	21,248	18,162
46	3,730,736	6,021,621	117,496	84,257	290,266	95,825	5,105,240	.....	24,820	.....	369,708	6,592,776	1,301,702
47	407,679	365,069	25,510	26,069	37,314	5,017	232,064	3,000	2,041	.....	39,263	390,712	158,731
48	2,224,909	3,051,920	154,813	380,603	147,885	7,800	1,332,946	30,731	12,251	3,088	981,689	3,514,670	2,173,870
49	30,535	57,569	9,226	1,501	23,569	1,631	7,021	2,695	91	2,390	9,235	68,734	60,082
50	356,887	201,059	14,280	17,680	126,338	67,080	41,850	.....	2,772	.....	20,459	327,610	218,080
51	6,493,325	5,970,963	393,303	692,192	1,701,128	78,598	1,874,987	105,383	35,717	271,812	817,844	7,173,230	5,219,645
52	46,749	51,821	3,730	2,004	15,594	1,701	23,078	520	448	120	4,506	63,599	38,820
53	2,516,295	1,805,094	31,270	29,736	140,275	33,110	1,577,000	2,904	8,801	1,750	70,248	2,667,719	440,009
54	1,827,376	1,649,262	81,743	63,880	519,049	27,292	689,916	4,218	27,339	58,163	177,662	1,960,543	1,233,335
55	18,825	5,684	.....	.....	2,600	152	1,765	360	70	.....	737	9,300	7,383
56	2,515,275	1,745,036	55,842	16,764	419,233	29,476	1,097,257	450	10,060	.....	115,954	1,862,311	675,578
57	27,163,544	18,116,121	552,010	632,822	2,261,327	645,580	11,245,975	82,929	882,397	10,773	1,801,308	21,127,989	9,236,434

4 All other industries embrace—Continued.

Hand stamps and stencils and brands.....	8	Rubber goods, not elsewhere specified.....	1	Sulphuric, nitric, and mixed acids.....	1
Hats and caps, other than felt, straw, and wool...	1	Rules, ivory and wood.....	1	Tobacco manufactures.....	63
House-furnishing goods, not elsewhere specified....	1	Scales and balances.....	1	Toys and games.....	1
Iron and steel, steel works and rolling mills.....	1	Shipbuilding, including boat building.....	3	Type founding and printing materials.....	2
Iron and steel, doors and shutters.....	1	Shoddy.....	1	Upholstering materials.....	6
Mineral and soda waters.....	83	Show cases.....	2	Vinegar and cider.....	1
Mirrors.....	2	Signs and advertising novelties.....	1	Wall plaster.....	2
Musical instruments, pianos and organs, and mate- rials.....	2	Smelting and refining, copper.....	2	Wheelbarrows.....	1
Oil, not elsewhere specified.....	1	Soap.....	5	Window shades and fixtures.....	3
Optical goods.....	1	Sporting and athletic goods.....	1	Wirework, including wire rope and cable.....	4
Paving materials.....	2	Stationary goods, not elsewhere specified.....	2	Wood, turned and carved.....	42
		Stereotyping and electrotyping.....	2		

## MANUFACTURES: TEXAS

## STATISTICS OF MANUFACTURES FOR THE STATE, CITIES, AND INDUSTRIES

Prepared under the supervision of W. M. STEUART, Chief Statistician for Manufactures

## INTRODUCTION.

This advance bulletin gives the statistics of manufactures for the state of Texas for the calendar year 1909 as shown by the Thirteenth Census. It will be reprinted without change as a part of the Compendium of the Census for Texas, and in the final reports of the Thirteenth Census.

The text summarizes the general results of the census inquiry, presenting a series of special tables in which the main facts printed in the general tables are given in convenient form for the state as a whole and for important industries. It also presents tables in which the statistics for the industries of the state as a whole and for a few important industries are classified by character of ownership, size of establishments, number of wage earners, and prevailing hours of labor, information which could not be presented in general tables for each industry without disclosing the facts for individual establishments.

At the end of the bulletin are two general tables.

Table I gives for 1909, 1904, and 1899 the number of establishments and of persons engaged in the industries, primary power, capital, salaries and wages, cost of materials, value of products, and value added by manufacture reported for all industries combined and for certain important industries (1) for the state as a whole and (2) for the cities of San Antonio, Dallas, Houston, and Fort Worth. It also gives the same items for all industries combined for every city and town having in 1910 a population of over 10,000 but less than 50,000.

Table II gives statistics in detail for 1909 for the state and for a larger number of industries.

**Scope of census: Factory industries.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of organization, location of establishments, size of establishments, labor force, and similar subjects. When use is made of the data for these purposes, it is imperative that due attention should be given to the limitations of the figures. Particularly is this true when the attempt is made to derive from them figures purporting to show average wages, cost of production, or profits. These limitations will be fully discussed in the general report on manufactures for the United States as a whole. It is impossible to reproduce such discussion in the bulletins relative to the individual states.

The census of 1909, like that of 1904, was confined to manufacturing establishments conducted under the factory system, as dis-

tinguished from the neighborhood, hand, and building industries. Where statistics for 1899 are given they have been reduced to a comparable basis by eliminating the latter classes of industries. The census does not include establishments which were idle during the entire year, or had a value of products of less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions, or in governmental establishments, except those of the Federal Government.

**Period covered.**—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—The term "establishment" comprises the factories, mills, or plants which are under a common ownership or control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment as thus defined were not all located within the same city or state, separate reports were secured in order that the separate totals might be included in the statistics for each city or state. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products very different from those covered by the class designation, and, on the other hand, may not include the total product covered by this designation, because some part of this product may be made in establishments in which it is not the product of chief value.

**Selected industries.**—The general tables at the end of this bulletin give the principal facts separately for the industries of the state. A selection has been made of the leading industries of the state for more detailed consideration. Sometimes an industry of greater importance than some of those selected is omitted because it comprises so few establishments that these detailed presentations would reveal the operations of individual concerns.

**Comparisons with previous censuses.**—Owing to the changes in industrial conditions it is not always possible to classify establishments by industries in such a way as to permit accurate comparison with preceding censuses. Table I, giving comparable figures for 1909, 1904, and 1899, therefore, does not embrace all the industries shown for 1909 in Table II.

**Influence of increased prices.**—In considering changes in cost of materials, value of products, and value added by manufacture, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures can not be taken as an exact measure of increase in the volume of business.

**Persons engaged in industry.**—At the censuses of 1909, 1904, and 1899 the following general classes of persons engaged in manufacturing industries have been distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks, and (5) wage earners. In the censuses of 1904 and 1899 these five classes were shown according to the three

main groups: (1) Proprietors and firm members, (2) salaried officials, clerks, etc., and (3) wage earners. The second group included the three classes of salaried officers of corporations, superintendents and managers, and clerks. In the present census an entirely different grouping is employed: That into (1) proprietors and officials, (2) clerks, and (3) wage earners. The first group includes proprietors and firm members, salaried officers of corporations, and superintendents and managers.

At this census the number of persons engaged in the industries, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for December 15, or the nearest representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where conditions were exceptional, and particularly in the case of certain seasonal industries, such as canning, the December date could not be accepted as typical, and an earlier date had to be chosen.

In the case of employees other than wage earners the number thus reported on December 15, or other representative day, has been treated as equivalent to the average for the year, since the number of employees of this class does not vary much from month to month in a given industry. In the case of wage earners the average is obtained in the manner explained in the next paragraph.

**Wage earners.**—In addition to the report by sex and age of the number of wage earners on December 15, or other representative day, a report was obtained of the number employed on the 15th of each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because in view of the variations of date such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In particular, totals by sex and age for the wage earners reported for the representative day would be misleading because of the undue weight given to seasonal industries, in some of which, such as canning and preserving, the distribution of the wage earners by sex and age is materially different from that in most industries of more regular operation. In order to determine as nearly as possible the sex and age distribution of the average number of wage earners in the state as a whole, the following procedure has been adopted:

The percentage distribution by sex and age of the wage earners in each industry, for December 15, or the nearest representative day, has been calculated from the actual numbers reported for that date. This percentage has been applied to the average number of wage earners for the year in that industry, to determine the average number of men, women, and children employed. These calculated averages for the several industries have been added up to give the average distribution for the state as a whole.

In 1899 and 1904 the schedule called for the average number of wage earners of each sex 16 years and over, and the total number under 16 years of age, for each month, and these monthly statements were combined in an annual average. Comparatively few manufacturing concerns, however, keep their books in such way as to show readily the number of men, women, and children (under 16) employed each month. These monthly returns by sex and age were, in fact, largely estimates. It was believed that a more accurate and reliable sex and age distribution could be secured by taking as a basis of estimate the actual numbers employed on a single day.

**Prevailing hours of labor.**—The census made no attempt to ascertain the number of employees working a given number of hours per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and no attention is given to the fact that a limited number of employees may have hours differing from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

**Capital.**—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

**Materials.**—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term materials includes fuel, rent of power and heat, mill supplies, and containers, as well as materials forming a constituent part of the product. Fuel includes all fuel used, whether for heat, light, or power, or for the process of manufacture.

**Expenses.**—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness, and allowances for depreciation.

**Value of products.**—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

**Value added by manufacture.**—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishments. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "value added by manufacture."

**Cost of manufacture and profits.**—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products, the rate of profit on the investment could not properly be calculated, because of the very defective character of the returns regarding capital.

**Primary power.**—The figures given for this item show the total of the primary power used by the establishments. They do not cover

the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

**Location of establishments.**—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the fact that often establishments are located just outside the boundaries of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

### INDUSTRIES IN GENERAL.

**General character of the state.**—Texas, with a gross area of 265,896 square miles, of which 3,498 represent water surface, is the largest state in the Union. Its population in 1910 was 3,896,542, as compared with 3,048,710 in 1900 and 2,235,527 in 1890. It ranked fifth among the 49 states and territories of continental United States as regards population in 1910 and sixth in 1900. The density of population for the entire state was 14.8 per square mile, the corresponding figure for 1900 being 11.6. Twenty-four and one-tenth per cent of the entire population of the state resided in incorporated cities and towns having a population of 2,500 inhabitants or over, as against 17.1 per cent in 1900.

San Antonio, with a population of 96,614; Dallas, with 92,104; Houston, with 78,800; and Fort Worth, with 73,312, were the only cities in the state which had a population in 1910 of over 50,000. There were, however, 16 cities which had a population of over 10,000 but less than 50,000. These cities, in order of their importance in population, were as follows: El Paso, Galveston, Austin, Waco, Beaumont, Laredo, Denison, Sherman, Marshall, Paris, Temple, Brownsville, Palestine, Tyler, Cleburne, and San Angelo. Apart from these cities, only 8.2 per cent of the population in 1910 resided in places of 2,500 inhabitants or over.

The transportation facilities are exceptionally good. The state is traversed by several important railway systems and, with 13,521<sup>1</sup> miles in 1909, had more steam railway trackage than any other state in the Union. Although only navigable for light-draft vessels, there are a number of streams which afford water communication for a considerable area of the eastern part of the state. Galveston, an important commercial center in the state, is one of the largest ports of entry in the South. Sabine is also a port of growing prominence. These avenues of transportation afford excellent opportunities for interstate, domestic coastwise, and foreign commerce.

**Importance and growth of manufactures.**—The manufactures of Texas depend largely for their raw materials upon the stock-raising, agricultural, and mineral products of the state and have been greatly stimulated by the rapid increase in the production of these materials. Between 1849-50 and 1889-90 there was a steady growth in manufactures, but the total value of

**Laundries.**—The census of 1909 was the first to include statistics of laundries. The reports are confined to establishments using mechanical power. The data are presented separately and are not included in the general total for manufacturing industries, in order to avoid interference with comparisons with prior censuses.

**Custom gristmills.**—In order to make the statistics for 1909 comparable with those for 1904 the data for these mills have been excluded from all the tables presenting general statistics, and are given in a separate table at the end of this report.

the manufactures of the state, including the products of the neighborhood and hand industries, amounted to only \$70,434,000 in the latter year, while in 1909, exclusive of the value of the products of the neighborhood and hand industries, it had reached \$272,896,000, representing an increase of nearly 300 per cent during the 20 years. The population of the state during the same period increased only 74.3 per cent. The gross value of products per capita of the total population of the state increased from \$32 in 1889 to \$70 in 1909. The number of wage earners has not increased as rapidly as the value of manufactured products. It has, however, almost exactly kept pace with the growth in population, for the 34,794 wage earners reported in 1889 and the 70,230 reported in 1909 represent 1.6 per cent and 1.8 per cent of the total population of the state at the respective censuses. The proportion which the manufactures of the state represented of the total value of the products of manufacturing industries in the United States increased from eight-tenths of 1 per cent in 1889 to 1.3 per cent in 1909. Texas ranked twenty-fourth in 1889-90 among the states in respect to gross value of products, but advanced to seventeenth place in 1909.

The first table on the following page gives the most important figures relative to all classes of manufactures combined for 1909, 1904, and 1899, together with the percentages of increase from census to census.

In 1909 the state of Texas had 4,588 manufacturing establishments, which gave employment to an average of 84,575 persons during the year and paid out \$48,775,000 in salaries and wages. Of the persons employed, 70,230 were wage earners. These establishments turned out products to the value of \$272,896,000, to produce which materials costing \$178,179,000 were used. The value added by manufacture was thus \$94,717,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year.

In general, this table brings out the fact that while the growth of the manufacturing industries of Texas, as a whole, during the five-year period 1899-1904 was noteworthy, the growth during the more recent five-year period, 1904-1909, was even more pronounced. During the later period the number of establishments increased 45.3 per cent and the average number of wage earners 43.1 per cent, while the value of products increased 81.3 per cent and the value added by manufacture 60.7 per cent.

<sup>1</sup> Report of Interstate Commerce Commission, 1909.

operations. The industry has had a remarkable growth in the state during the past 10 years, and in 1909 Texas was the fourth state in the Union in the production of refined petroleum.

In addition to the industries presented separately in the above table and petroleum refining, there are six important industries each of which had a value of products in 1909 exceeding \$1,000,000. They are included under the head of "All other industries" in the table because in some cases the operations of individual establishments would be disclosed if they were shown separately; in others because the returns do not properly present the true condition of the industry, as it is more or less interwoven with one or more industries; and in still others because comparable statistics for the different census years can not be presented on account of changes in classification or the data for prior censuses are not available. These industries are as follows: Bags, other than paper; coffee and spice, roasting and grinding; mineral and soda waters; smelting and refining, copper; smelting and refining, lead; and wood preserving. For similar reasons, 30 less important industries which had a value of products in 1909 in excess of \$100,000 but less than \$1,000,000 are also included under "All other industries."

The most important industries listed in the preceding table, in which they are arranged in the order of the value of products, call for brief consideration.

*Slaughtering and meat packing.*—This classification includes the wholesale slaughtering and meat-packing establishments and those engaged in the manufacture of sausage only. Although stock raising has always been an exceedingly important industry in the state, only during the last decade has slaughtering and meat packing assumed large proportions. From a comparatively small industry in 1899, it had become the leading industry of the state in 1909 as measured by value of products.

*Flour-mill and gristmill products.*—All mills which grind wheat, rye, or buckwheat flour, or corn meal, hominy, grits, or feed are included in this industry. Factories making fancy cereals or other food preparations as a chief product are not included. Furthermore, the statistics for mills grinding exclusively for toll, usually small and operated for local consumption, are not included in this classification or in the general statistics for the state, but are shown separately on page 18.

*Lumber and timber products.*—This industry includes logging operations, the sawmills, shingle mills, planing mills, and wooden packing-box factories. From the standpoint of the number of wage earners, this is the most important industry in the state, the average number of wage earners reported for 1909 constituting 33.5 per cent of the total employed in all manufactures in the state.

*Oil, cottonseed, and cake.*—The statistics include those for all establishments engaged primarily in

extracting oil from cotton seed or refining crude cottonseed oil. Prior to 1870 cotton seed was considered practically worthless, except for planting, and it was not until after 1880 that it came to be extensively utilized in the United States. Texas, the leading cotton-producing state, has naturally become also the leading state in the manufacture of cottonseed products, which position it has held since 1889. In 1909 it contributed 20.2 per cent of the total value of cottonseed products reported for the United States. The percentage of increase in value added by manufacture from 1904 to 1909 was much greater than the percentage of increase in value of products, although both increases were large.

*Cars and general shop construction and repairs by steam-railroad companies.*—This industry represents the work done in the car shops of steam-railroad companies, and is practically confined to repairs of the rolling stock and equipment of their own roads, although to a limited extent there may be some new construction of rolling stock. The statistics are exclusive of minor repairs in roundhouses. Judged by the number of wage earners employed, this was the second industry in the state in 1909.

*Printing and publishing.*—All establishments primarily engaged in printing and publishing newspapers, books, periodicals, and music, job printing, bookbinding and blank-book making, lithographing, and engraving are included under this head. More establishments were reported for this industry in 1909 than for any other manufacturing industry in the state.

*Rice, cleaning and polishing.*—This is a comparatively new industry in the state and its growth has been remarkable. The first establishment was reported for the state in 1899, but in 1904, 17 establishments were in operation and the products were valued at \$4,640,000. With an increase during the next five years of 75.5 per cent in value of products, Texas became the second state in the Union in this industry.

Measured by value added by manufacture, all but one of these seven industries hold a somewhat different rank from that which they hold when measured by value of products. On account of the comparatively simple processes involved in slaughtering and meat packing, in the flour-mill and gristmill industry, and in cleaning and polishing rice, and the extent to which the work is carried on by machinery in the last two industries, the value added by manufacture is not commensurate with the value of products. For these reasons the slaughtering and meat-packing industry which stands first in value of products becomes fifth in importance on the basis of value added by manufacture, and the flour-mill and gristmill industry drops from second to eighth place, and the cleaning and polishing of rice from seventh to sixteenth place, while the lumber industry would stand first, printing and publishing second, steam-railroad repair shops third, and the cottonseed-oil industry fourth. Similar changes would occur in the relative standing of many of the other industries.

## MANUFACTURES—TEXAS.

The table on page 4 shows also the percentages of increase for these leading industries in respect to value of products and value added by manufacture where the figures are comparable. For the five-year period, 1904-1909, the manufacture of food preparations shows a greater rate of increase in value of products, and that of butter, cheese, and condensed milk a greater relative gain in value added by manufacture, than any of the other specified industries, namely, 1,294.4 per cent and 828.6 per cent, respectively. The remarkable increase in the former industry was due in a large measure to the increased production of establishments manufacturing lard compound, and of those making macaroni, and in the latter industry almost entirely to the decided gain of those which manufacture butter. The furniture and refrigerator and the slaughtering and meat-packing industries also show remarkable increases in both items. As the latter is the leading industry in the state, the percentages of increase, although not so great as those shown for most of the other three industries mentioned above, are the most significant. There are some striking differences among the several industries specified as respects the relative increase for the two five-year periods covered by the table. Of the first 20 industries presented separately, however, all show an increase for each period in value of products, and all but two an increase in value added by manufacture.

**Persons engaged in manufacturing industries.**—The following table shows for 1909 the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables is an estimate obtained by the method described in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes.....	84,575	70,096	4,879
Proprietors and officials.....	7,911	7,763	148
Proprietors and firm members.....	4,496	4,373	123
Salaried officers of corporations.....	940	920	11
Superintendents and managers.....	2,475	2,461	14
Clerks.....	6,434	5,808	626
Wage earners (average number).....	70,230	66,125	4,105
16 years of age and over.....	68,074	65,092	3,882
Under 16 years of age.....	1,256	1,033	223

The average number of persons engaged in manufactures during 1909 was 84,575, of whom 70,230 were wage earners. Of the remainder, 7,911 were proprietors and officials and 6,434 were clerks. Corresponding figures for individual industries will be found in Table II, page 24.

The next table shows for 1909 the percentage of proprietors and officials, clerks, and wage earners, respectively, among the total number of persons employed in manufactures. It covers all industries combined and 15 important industries individually.

INDUSTRY.	PERSONS ENGAGED IN MANUFACTURES.			
	Total number.	Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
All industries.....	84,575	9.4	7.6	83.0
Bread and other bakery products.....	2,078	22.8	10.3	60.9
Brick and tile.....	2,135	6.8	2.5	90.6
Cars and general shop construction and repairs by steam-railroad companies.....	10,527	2.6	4.4	92.9
Cotton goods, including cotton small wares.....	1,633	1.5	1.2	97.4
Flour-mill and gristmill products.....	1,890	19.9	16.1	64.0
Food preparations.....	367	10.6	12.0	77.4
Foundry and machine-shop products.....	3,441	8.3	6.7	85.0
Ice, manufactured.....	1,874	15.0	8.3	76.7
Leather goods.....	1,012	12.4	16.4	71.2
Liquors, malt.....	931	5.8	12.0	82.2
Lumber and timber products.....	25,843	6.1	2.0	91.0
Oil, cottonseed, and cake.....	3,923	12.6	0.0	78.3
Printing and publishing.....	7,177	22.1	16.5	61.4
Rice, cleaning and polishing.....	643	11.4	21.8	66.0
Slaughtering and meat packing.....	4,248	1.0	13.3	85.7
All other industries.....	16,844	12.2	9.0	77.0

Of the total number of persons engaged in all manufacturing industries, 9.4 per cent were proprietors and officials, 7.6 per cent clerks, and 83 per cent wage earners. In the bakery, the printing and publishing, and the flour-mill and gristmill industries, the majority of the establishments are small and the work is to a large extent done by the proprietors or their immediate representatives, so that the proportion of persons engaged in these industries falling into the class of proprietors and officials is, therefore, much greater than for most other industries or for all industries combined. Similar conditions prevail, but to a less degree, in the manufactured-ice and the leather-goods industries, and also in the manufacture of cottonseed products, although in the latter industry the establishments are somewhat larger. The smallest proportions for this class are shown for the slaughtering and meat-packing and the cotton-goods industries, on account of the large average number of wage earners to an individual establishment, and because all of the establishments in the latter and all but two in the former industry are under corporate ownership.

The following table shows, for 1909, in percentages for all industries combined the distribution of the average number of wage earners by age periods, and for those 16 years of age and over by sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries separately, a similar distribution of wage earners as reported for December 15, or the nearest representative day. As a means of judging the importance of the several industries the average number employed for the year is also given in each case.

INDUSTRY.	WAGE EARNERS.			
	Average number. <sup>1</sup>	Per cent of total.		
		16 years of age and over.		Under 16 years of age.
	Male.	Female.		
<b>All industries.....</b>	<b>70,230</b>	<b>92.7</b>	<b>5.5</b>	<b>1.8</b>
Bread and other bakery products.....	1,391	71.2	25.7	3.0
Brick and tile.....	1,935	97.6	.....	2.4
Cars and general shop construction and repairs by steam-railroad companies.....	9,782	99.9	( <sup>2</sup> )	( <sup>2</sup> )
Cotton goods, including cotton small wares.....	1,590	53.1	32.7	14.2
Flour-mill and gristmill products.....	1,216	99.3	0.2	0.4
Food preparations.....	284	71.1	28.2	0.7
Foundry and machine-shop products.....	2,925	99.2	0.1	0.8
Ice, manufactured.....	1,437	99.4	0.1	0.5
Leather goods.....	721	97.1	1.7	1.2
Liquors, malt.....	765	99.9	0.1	.....
Lumber and timber products.....	23,518	98.5	0.2	1.3
Oil, cottonseed, and cake.....	3,073	99.9	0.1	.....
Printing and publishing.....	4,408	80.3	13.9	5.8
Rice, cleaning and polishing.....	430	100.0	.....	.....
Slaughtering and meat packing.....	3,639	91.7	6.4	1.9
All other industries.....	13,116	82.6	15.4	2.0

<sup>1</sup> For method of estimating the distribution by sex and age periods, of the average number in all industries combined, see Introduction.  
<sup>2</sup> Less than one-tenth of 1 per cent.

For all industries combined, 92.7 per cent of the average number of wage earners were males 16 years of age and over; 5.5 per cent females 16 years of age and over; and 1.8 per cent children under 16 years of age. The relatively small proportion of women and children employed in Texas is of interest. Of the industries shown in this table, the cotton mills, the factories engaged in the manufacture of food preparations, the bakeries, and printing and publishing establishments report the largest proportions of female wage earners. In the cotton-goods industry nearly one-third of the employees were women 16 years of age and over; in the manufacture of food preparations nearly three-fourths; in the bakeries about one-fourth; and in printing and publishing establishments nearly one-seventh. The largest actual number of female wage earners 16 years of age and over were employed in the men's clothing industry, which is included under the head of "All other industries." In this industry women formed nearly nine-tenths of the total number of wage earners. The confectionery establishments also employed a large number of female wage earners.

The largest proportions of wage earners under 16 years of age are shown for the cotton-goods and the printing and publishing industries. Although a greater actual number of wage earners under 16 years of age was reported for the lumber industry than for any other in the state, the number of wage earners of all classes shown for that industry is so large that this particular class of employees forms but a small proportion of the total shown for the industry.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904, it is necessary to use the classification employed at the earlier census. (See Intro-

tion.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				
	1909		1904		Per cent of increase, 1904-1909.
	Number.	Per cent distribution.	Number.	Per cent distribution.	
<b>Total.....</b>	<b>84,575</b>	<b>100.0</b>	<b>57,892</b>	<b>100.0</b>	<b>46.1</b>
Proprietors and firm members.....	4,496	5.3	3,073	5.3	40.3
Salaried employees.....	9,849	11.6	5,753	9.9	71.2
Wage earners (average number)....	70,230	83.0	49,066	84.8	43.1

Comparable figures are not obtainable for 1899. The table shows the greatest percentage of increase to have been in the salaried employees, which is the only class forming a larger proportion of the total in 1909 than in 1904.

The next table shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over according to sex, for 1909, 1904, and 1899. The averages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Percent distribution.	Number.	Percent distribution.	Number.	Percent distribution.
<b>Total.....</b>	<b>70,230</b>	<b>100.0</b>	<b>49,066</b>	<b>100.0</b>	<b>38,604</b>	<b>100.0</b>
16 years of age and over..	68,974	98.2	48,245	98.3	37,688	97.6
Male.....	65,092	92.7	45,766	93.3	35,905	93.2
Female.....	3,882	5.5	2,479	5.1	1,693	4.4
Under 16 years of age....	1,256	1.8	821	1.7	616	2.4

This table indicates that for all industries combined there has not been much change in the proportion of male and female wage earners. The proportion of children under 16 years of age was smaller in 1909 than in 1899, although slightly larger than in 1904. In 1909 males 16 years of age and over formed 92.7 per cent of all wage earners, as compared with 93.3 per cent in 1904 and 93.2 per cent in 1899.

**Wage earners employed by months.**—The following table gives the number of wage earners employed on the 15th of each month during the year 1909 for all industries combined, for the cottonseed-oil industry, and for all other industries combined. It gives also the percentage which the number reported for each month is of the greatest number reported for any month. In Table II, page 24, are shown for practically all of the important industries in the state the largest number and the smallest number of wage earners reported for any month. The figures are for the 15th day, or the nearest representative day, of the month.

MANUFACTURES—TEXAS.

MONTH.	NUMBER OF WAGE EARNERS.					
	All industries.		Oil, cottonseed, and cake.		All other industries.	
	Number.	Percent of maximum.	Number.	Percent of maximum.	Number.	Percent of maximum.
January .....	68,563	90.6	4,331	75.2	64,232	91.9
February .....	66,485	87.9	3,534	61.3	62,951	90.1
March .....	68,082	90.0	2,195	38.1	65,887	94.3
April .....	67,772	89.6	1,396	24.2	66,376	95.0
May .....	66,079	87.4	1,087	18.9	64,992	93.0
June .....	68,037	89.0	932	16.2	67,105	95.0
July .....	69,153	91.4	967	16.8	68,186	97.6
August .....	69,192	91.5	1,422	24.7	67,770	97.0
September .....	73,196	96.8	4,067	71.1	69,099	98.9
October .....	76,291	99.5	5,718	99.2	69,573	96.6
November .....	76,648	100.0	5,762	100.0	69,886	100.0
December .....	76,258	99.5	5,430	94.2	69,828	99.9

In addition to that shown for the cottonseed-oil industry, there was a considerable variation in the number of wage earners employed from month to month in the sugar and molasses industry, but the numbers of wage earners reported for the industry were too small to affect materially the totals for the state. In the cottonseed-oil industry the period of greatest employment of wage earners follows closely

upon the maturity of the cotton crop. The smallest number, 932, were employed in June, from which time the number increased constantly to November, when 5,762 were employed, or 4,830 more than in June. The table indicates that, for all industries combined, the month of minimum employment was May and the month of maximum employment November. With the cottonseed-oil industry excluded, November remains the month of greatest activity, but February takes the place of May as the month of least activity, and the employment throughout the year becomes much steadier, the month of least employment showing a difference of only 6,935, or 9.9 per cent, from the month of greatest employment.

**Prevailing hours of labor.**—In the following table wage earners have been classified according to the hours of labor prevailing in the establishments in which they are employed. In making this classification the average number of wage earners employed during the year is used, and the number employed in each establishment is classified as a total according to the hours prevailing in that establishment, even though a few employees work a greater or less number of hours.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries .....	70,230	6,575	1,356	12,945	2,981	30,583	8,318	4,188	2,784
Bread and other bakery products .....	1,301	00	6	125	11	882	201	56	50
Brick and tile .....	1,035	20	30	222	43	1,488	128	4	3
Butter, cheese, and condensed milk .....	84	5	.....	.....	.....	10	57	.....	.....
Canning and preserving .....	158	.....	.....	.....	20	114	.....	24	.....
Carriages and wagons and materials .....	412	39	12	187	51	100	.....	.....	13
Cars and general shop construction and repairs by steam-railroad companies .....	9,782	1,000	153	5,092	727	1,727	1,067	.....	7
Clothing, men's, including shirts .....	902	521	155	83	22	211	.....	.....	.....
Confectionery .....	717	22	2	64	72	545	12	.....	.....
Cooperage and wooden goods, not elsewhere specified .....	243	33	2	.....	.....	208	.....	.....	.....
Copper, tin, and sheet-iron products .....	733	461	.....	197	.....	74	.....	1	.....
Cotton goods, including cotton small wares .....	1,500	.....	.....	.....	.....	307	1,193	.....	.....
Flour-mill and gristmill products .....	1,216	108	.....	2	.....	281	200	025	.....
Food preparations .....	284	4	.....	35	.....	221	.....	24	.....
Foundry and machine-shop products .....	2,925	60	283	1,772	35	773	4	8	.....
Furniture and refrigerators .....	701	17	.....	480	21	183	.....	.....	.....
Gas, illuminating and heating .....	575	10	.....	33	65	186	134	45	102
Ice, manufactured .....	1,437	36	16	.....	46	121	97	181	940
Leather goods .....	721	6	1	32	382	300	.....	.....	.....
Lime .....	348	8	.....	.....	.....	291	.....	.....	49
Liquors, malt .....	765	273	.....	24	406	2	.....	.....	.....
Lumber and timber products .....	23,518	632	355	784	315	16,961	4,471	.....	.....
Marble and stone work .....	905	333	50	110	37	66	.....	.....	.....
Mattresses and spring beds .....	233	14	.....	71	10	138	.....	.....	.....
Oil, cottonseed, and cake .....	3,073	33	.....	.....	.....	206	110	2,565	159
Patent medicines and compounds and druggists' preparations .....	145	61	3	24	33	24	.....	.....	.....
Pottery, terra-cotta, and fire-clay products .....	420	1	.....	.....	.....	410	.....	.....	.....
Printing and publishing .....	4,408	2,191	608	750	320	497	29	4	.....
Rice, cleaning and polishing .....	430	.....	.....	.....	.....	164	160	106	.....
Salt .....	162	1	.....	.....	.....	23	70	.....	59
Slaughtering and meat packing .....	3,639	9	.....	1,631	.....	1,049	.....	.....	50
Tobacco manufactures .....	330	217	85	20	3	14	.....	.....	.....
All other industries .....	6,249	392	85	1,198	302	1,099	370	545	1,352

It is evident from these figures that for the majority of wage earners employed in the manufacturing industries of Texas the prevailing hours of labor range from 54 to 60 a week, 12 per cent of the total number being employed in establishments where less than 54 hours a week prevail and 21.8 per cent in establishments where more than 60 hours a week prevail.

It will be noted that the cottonseed-oil industry is mainly on a 72-hour basis, but relatively long hours might be expected in a seasonal industry where the operations for the entire year are confined to about seven months. The prevailing hours in the cotton-goods industry are between 60 and 72 hours a week; in the lumber and timber products industry, 60 hours

a week; and in the steam-railroad repair shops and the foundries and machine shops, 54 hours a week.

**Location of establishments.**—The next table shows to what extent the manufactures of Texas are centralized in cities of 10,000 inhabitants or over. (See

Introduction.) The comparison of the statistics is confined here, as in other states, to the years 1899 and 1909, in the absence of a Federal census of population by which the grouping of cities in 1904 could be determined.

ITEM.	Year.	Aggregate.	CITIES HAVING A POPULATION OF 10,000 AND OVER.						DISTRICTS OUTSIDE OF CITIES HAVING A POPULATION OF 10,000 AND OVER.	
			Total.		10,000 to 25,000.		25,000 to 100,000.		Number or amount.	Percent of total.
			Number or amount.	Percent of total.	Number or amount.	Percent of total.	Number or amount.	Percent of total.		
Population.....	1010	3,896,542	620,712	15.9	147,337	3.8	473,375	12.1	3,275,830	84.1
	1900	3,048,710	299,398	9.8	94,320	3.1	205,009	6.7	2,740,312	90.2
Number of establishments.....	1909	4,588	1,614	35.2	350	7.6	1,264	27.6	2,074	64.8
	1899	3,107	870	28.3	276	8.9	603	19.4	2,228	71.7
Average number of wage earners.....	1909	70,230	26,303	37.5	6,286	0.0	20,017	28.5	43,927	62.5
	1899	38,004	14,647	37.9	3,569	9.2	11,078	28.7	23,957	62.1
Value of products.....	1909	\$272,805,035	\$109,559,457	40.1	\$19,928,547	7.3	\$89,639,510	32.8	\$163,336,578	59.9
	1899	92,894,433	37,036,220	39.9	6,904,458	7.4	30,131,771	32.4	55,888,204	60.1
Value added by manufacture.....	1909	94,717,120	42,844,670	45.2	7,074,011	7.5	35,770,050	37.8	51,872,150	54.8
	1899	38,506,130	16,410,242	42.6	2,004,238	7.8	13,416,004	34.8	22,095,888	57.4

In 1909, 40.1 per cent of the total value of products was reported from cities having over 10,000 inhabitants, and 37.5 per cent of the average number of wage earners were employed in such cities. The figures indicate that during the decade the industries of the cities referred to gained slightly in value of products on those of the districts outside.

The increase in the population of different cities has affected the grouping in the table. In 1900 Austin, El Paso, and Waco were in the first group, but during the following decade the population of each increased so that in 1910 they fell into the second group. In 1900 the cities of Beaumont, Brownsville, Cleburne, Marshall, Palestine, Paris, San Angelo, Temple, and Tyler each had less than 10,000 inhabitants, and so were included in the outside districts. The total value of products reported for these nine cities in 1909 was \$13,717,717, and represented 5 per cent of the total shown for all manufactures of the state. The shifting of these cities from the outside to the city districts has, therefore, affected the showing in the table.

The population for 1910 and 1900 of the 20 cities which had 10,000 inhabitants or over in 1910 is given in the following statement:

CITY.	1910	1900	CITY.	1910	1900
San Antonio.....	96,614	53,321	Demison.....	13,632	11,807
Dallas.....	92,104	42,638	Sherman.....	12,412	10,243
Houston.....	78,800	44,633	Marshall.....	11,452	7,855
Fort Worth.....	73,312	26,638	Paris.....	11,260	9,358
El Paso.....	39,279	15,006	Temple.....	10,993	7,065
Galveston.....	36,081	37,789	Brownsville.....	10,517	6,305
Austin.....	29,800	22,258	Palestine.....	10,482	8,207
Waco.....	26,425	20,686	Tyler.....	10,400	8,060
Beaumont.....	20,640	9,427	Cleburne.....	10,364	7,403
Laredo.....	14,855	13,420	San Angelo.....	10,321	( <sup>1</sup> )

<sup>1</sup> Not incorporated in 1900.

The relative importance in manufactures of each of the 20 cities having a population of 10,000 or over in

1910 is shown in the following table, in which the value of products and average number of wage earners are shown separately for 1909, 1904, and 1899:

CITY.	AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.		
	1909	1904	1899	1909	1904	1899
Dallas.....	4,882	3,446	2,842	\$20,958,664	\$15,027,068	\$9,488,252
Houston.....	5,338	5,050	3,188	23,015,556	13,564,019	7,491,971
San Antonio.....	3,105	2,457	2,683	13,434,897	7,492,262	5,988,681
Fort Worth.....	2,050	1,423	943	8,660,882	5,608,391	3,487,544
Galveston.....	1,004	761	1,422	6,308,076	2,996,054	3,675,323
Beaumont.....	863	732	1,005	4,830,501	2,009,829	1,613,352
Waco.....	1,033	947	1,004	4,769,358	2,979,800	2,293,631
Sherman.....	273	307	314	4,675,971	2,644,086	1,461,469
El Paso.....	1,752	1,158	716	3,637,577	2,377,813	1,213,009
Austin.....	754	641	495	2,845,500	1,509,353	764,748
Marshall.....	977	( <sup>2</sup> )	( <sup>2</sup> )	1,787,146	( <sup>2</sup> )	( <sup>2</sup> )
Cleburne.....	825	( <sup>2</sup> )	( <sup>2</sup> )	1,576,572	( <sup>2</sup> )	( <sup>2</sup> )
Paris.....	541	210	263	1,420,943	854,930	743,320
Temple.....	366	( <sup>2</sup> )	( <sup>2</sup> )	1,345,770	( <sup>2</sup> )	( <sup>2</sup> )
Demison.....	833	725	668	1,313,785	1,234,956	840,302
Palestine.....	745	544	481	1,312,845	735,102	704,152
Tyler.....	484	308	431	996,243	628,666	681,604
San Angelo.....	115	( <sup>3</sup> )	( <sup>3</sup> )	317,801	( <sup>3</sup> )	( <sup>3</sup> )
Laredo.....	213	515	372	221,074	453,974	331,200
Brownsville.....	51	( <sup>2</sup> )	( <sup>2</sup> )	120,746	( <sup>2</sup> )	( <sup>2</sup> )

<sup>1</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

<sup>2</sup> Figures not available.

<sup>3</sup> Not incorporated in 1900.

With the exception of Laredo, each city for which comparative figures are available shows an increase in the value of its manufactured products from 1904 to 1909, and all except Galveston (which was almost destroyed by a tidal wave in 1900), and Tyler show an increase from 1899 to 1904. Austin showed the greatest relative increase for the decade 1899-1909, namely, 272.1 per cent; Sherman was next with 220 per cent, followed by Houston with 207.2 per cent, and El Paso with 199.9 per cent. Notwithstanding these decided gains the several cities held generally the same relative rank at each of the three censuses.

Dallas, the largest manufacturing center in the state, has for its leading industries, as measured by value of products, the slaughtering and meat packing, flour-

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>									
1909.....	4,588	70,230	\$272,895,635	\$94,717,120	<b>Foundry and machine-shop products, 1909—Continued.</b>				
1904.....	3,158	49,066	150,528,389	58,924,750	Per cent of total.....	100.0	100.0	100.0	100.0
Individual:					Individual.....	41.3	19.4	9.7	10.9
1909.....	2,200	9,295	23,161,308	12,016,023	Firm.....	21.0	8.0	8.1	7.0
1904.....	1,076	7,320	10,408,988	8,902,545	Corporation.....	37.8	83.6	84.2	82.0
Firm:					<b>Iron, manufactured, 1909.....</b>	182	1,437	\$3,844,120	\$2,762,277
1909.....	909	6,185	18,527,165	8,524,324	Individual.....	37	210	519,927	388,701
1904.....	629	4,792	13,525,663	6,245,702	Firm.....	17	76	249,837	167,588
Corporation:					Corporation.....	128	1,152	3,074,356	2,195,988
1909.....	1,352	54,697	231,050,361	74,067,757	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	839	36,905	120,133,146	43,667,383	Individual.....	20.3	14.6	13.5	14.1
Other:					Firm.....	9.3	5.2	6.5	6.1
1909.....	37	53	147,801	100,010	Corporation.....	70.3	80.2	80.0	79.8
1904.....	14	40	460,592	109,129	<b>Leather goods, 1909.....</b>	07	721	\$4,347,445	\$1,508,571
Per cent of total:					Individual.....	33	117	384,933	209,461
1909.....	100.0	100.0	100.0	100.0	Firm.....	15	113	614,749	293,956
1904.....	100.0	100.0	100.0	100.0	Corporation.....	19	491	3,347,763	1,095,154
Individual:					Per cent of total.....	100.0	100.0	100.0	100.0
1909.....	49.0	13.2	8.5	12.7	Individual.....	49.3	16.2	8.9	13.9
1904.....	53.1	14.0	10.9	15.1	Firm.....	22.4	15.7	14.1	13.5
Firm:					Corporation.....	28.4	68.1	77.0	72.0
1909.....	10.8	8.8	6.8	9.0	<b>Lumber and timber products, 1909.....</b>	799	23,518	\$82,201,440	\$21,197,137
1904.....	10.9	9.8	9.0	10.0	Individual.....	350	3,035	3,539,010	2,532,748
Corporation:					Firm.....	207	3,238	4,604,336	3,343,077
1909.....	29.5	77.9	84.7	78.2	Corporation.....	182	17,245	24,058,094	15,320,712
1904.....	26.6	75.2	79.8	74.1	Per cent of total.....	100.0	100.0	100.0	100.0
Other:					Individual.....	43.8	12.9	11.0	12.0
1909.....	0.8	0.1	0.1	0.1	Firm.....	33.4	13.8	14.3	15.8
1904.....	0.4	0.1	0.3	0.2	Corporation.....	22.8	73.3	74.7	72.3
<b>Bread and other bakery products, 1909.....</b>	385	1,301	\$5,310,785	\$2,248,540	<b>Oil, cottonseed, and cake, 1909.....</b>	194	3,073	\$20,915,772	\$6,476,711
Individual.....	324	997	2,817,158	1,192,510	Individual.....	17	254	2,850,319	698,467
Firm.....	46	129	642,344	285,387	Firm.....	5	40	187,010	52,332
Corporation <sup>1</sup> .....	15	565	1,851,283	770,637	Corporation.....	172	2,779	27,377,843	5,725,912
Per cent of total.....	100.0	100.0	100.0	100.0	Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	84.2	50.1	53.0	53.0	Individual.....	8.8	8.3	7.9	10.8
Firm.....	11.9	9.3	12.1	12.7	Firm.....	2.6	1.3	0.6	0.8
Corporation <sup>1</sup> .....	3.9	40.6	34.9	34.3	Corporation.....	88.7	90.4	91.5	88.4
<b>Flour-mill and gristmill products, 1909.....</b>	238	1,216	\$32,484,012	\$3,827,071	<b>Printing and publishing, 1909.....</b>	1,087	4,408	\$11,587,255	\$8,780,015
Individual.....	81	144	2,585,772	312,743	Individual.....	078	1,297	2,720,781	2,175,050
Firm.....	59	180	4,972,248	613,308	Firm.....	198	778	1,685,556	1,283,057
Corporation.....	98	892	24,926,592	2,901,020	Corporation.....	150	2,310	7,080,290	5,212,443
Per cent of total.....	100.0	100.0	100.0	100.0	Other.....	32	23	94,022	79,465
Individual.....	34.0	11.8	8.0	8.2	Per cent of total.....	100.0	100.0	100.0	100.0
Firm.....	24.8	14.8	15.3	16.0	Individual.....	63.5	29.4	23.5	24.8
Corporation.....	41.2	73.4	70.7	75.8	Firm.....	18.6	17.6	14.5	14.6
<b>Foundry and machine-shop products, 1909.....</b>	143	2,925	\$8,067,941	\$4,208,470	Corporation.....	14.9	52.4	61.1	59.7
Individual.....	59	303	779,857	460,598	Other.....	3.0	0.5	0.8	0.9
Firm.....	30	170	400,890	205,848					
Corporation.....	54	2,446	6,797,188	3,452,024					

<sup>1</sup> Includes the group "Other," to avoid disclosure of individual operations.

For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available. Figures for 1909 only are presented for several important industries individually. In order to avoid disclosing the operations of individual concerns it is necessary to omit several important industries from this table and the one following.

The most important distinction shown is that between corporate and all other forms of ownership. For all industries combined, 29.5 per cent of the total number of establishments were in 1909 under corporate ownership, as against 70.5 per cent under all other forms. The corresponding figures for 1904 were 26.6 per cent and 73.4 per cent, respectively. In respect

to value of products, however, the establishments under corporate ownership are by far the most important. For all industries combined, as measured by value of products and value added by manufacture, as well as by number of establishments and average number of wage earners, corporate ownership gained ground during the five-year period. Among the important industries not shown in this table, it is worthy of note that all of the establishments engaged in steam-railroad car repair work and in the manufacture of cotton goods, and by far the larger number of those engaged in the brewery, rice cleaning and polishing, and slaughtering and meat-packing industries were under corporate ownership.

mill and gristmill, cottonseed products, printing and publishing, leather goods, and foundry and machine-shop industries. Statistics for the first three industries named can not be shown separately in Table I without disclosing the operations of individual establishments. Dallas is the center of the leather-goods industry, which includes the manufacture of saddlery and harness, contributing 52 per cent of the state's total value of products for this industry.

Foremost in Houston is the cottonseed-oil industry, the value of its products forming 15.4 per cent of the total value of manufactured products for the city. Slaughtering and meat packing, the cleaning and polishing of rice, steam-railroad repair shops, and the breweries each reporting over \$2,000,000 worth of products, follow in importance in the order named. Steam-railroad repair shops is the only one of these four industries for which separate figures can be given in Table I without disclosing the operations of individual concerns.

San Antonio, although having a greater population than any other city of Texas, ranked third in the value of its manufactures in 1909. As in Dallas and Houston, the statistics for the principal industries—the breweries, flour-mills and gristmills, and the cottonseed oil industry—can not be shown separately in Table I. The value of the malt liquors brewed in San Antonio represents nearly one-half the value of all malt liquors made in the state. Printing and publishing, slaughtering and meat packing, the manufacture of confectionery, and the steam-railroad repair shops are other leading industries, named in order of value of products.

Fort Worth is shown to be the fourth city in value of products. It should be stated, however, that just outside the corporate limits of the city are located some of the most important slaughtering and meat-packing establishments in the state. Since the census presents statistics for only those establishments which are within the corporate limits of cities, these slaugh-

tering plants, which may be regarded as a part of Fort Worth's manufacturing industries, are not included in the totals for that city. The leading industries within the city are flour mills and gristmills and rice cleaning and polishing.

In the remaining cities shown in the above table, the largest industries in 1909 were the flour mills and gristmills in Galveston and Sherman; the cleaning and polishing of rice in Beaumont; the cottonseed-oil industry in Waco, Austin, Paris, and Temple; steam-railroad repair shops in Cleburne, Denison, El Paso, Laredo, Marshall, Palestine, and Tyler; printing and publishing in San Angelo; and the manufacture of ice in Brownsville.

The statistics for that part of Texarkana which lies in Texas are included with those for the outside district in the table on page 9. The following statement presents the totals for the entire city and for the parts situated in Texas and Arkansas, respectively:

	Total for city.	Texarkana, Tex.	Texarkana, Ark.
Population.....	15,445	9,790	5,655
Number of establishments.....	47	25	21
Persons engaged in manufactures.....	1,063	823	240
Proprietors and firm members.....	40	18	22
Salaried employees.....	148	103	45
Wage earners (average number).....	875	702	173
Primary horsepower.....	2,902	1,597	1,305
Capital.....	\$1,792,430	\$1,394,040	\$398,387
Expenses.....	2,405,671	1,422,203	983,468
Services.....	575,548	466,375	109,173
Salaries.....	156,519	121,926	34,593
Wages.....	419,029	344,449	74,580
Materials.....	1,071,127	859,110	212,017
Miscellaneous.....	158,996	106,718	52,278
Value of products.....	2,646,521	1,604,434	1,042,087
Value added by manufacture (value of products less cost of materials).....	975,394	745,324	230,070

The leading industries of Texarkana, Tex., are the cooperage shops and the railroad repair shops, and of Texarkana, Ark., the manufacture of flour-mill and gristmill products and of cottonseed oil and cake.

**Character of ownership.**—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises:

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>					<b>Foundry and machine-shop products, 1909--Continued.</b>				
1909.....	4,588	70,230	\$272,896,636	\$94,717,120	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	3,158	40,066	150,528,389	58,924,759	Individual.....	41.3	10.4	0.7	10.9
Individual:					Firm.....	21.0	0.0	0.1	7.0
1909.....	2,200	9,205	23,101,308	12,010,023	Corporation.....	37.8	83.0	84.2	82.0
1904.....	1,670	7,320	10,408,988	8,902,545					
Firm:					<b>Ice, manufactured, 1909.....</b>	182	1,437	\$3,844,120	\$2,752,277
1909.....	909	6,185	18,527,105	8,524,324	Individual.....	37	210	510,027	388,701
1904.....	629	4,792	13,525,063	6,246,702	Firm.....	17	75	240,837	107,588
Corporation:					Corporation.....	128	1,152	3,074,356	2,105,988
1909.....	1,352	54,607	231,059,361	74,067,757	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	839	30,905	120,133,140	43,007,383	Individual.....	20.3	14.6	13.5	14.1
Other:					Firm.....	9.3	5.2	6.5	6.1
1909.....	37	53	147,801	109,010	Corporation.....	70.3	80.2	80.0	79.8
1904.....	14	49	400,592	109,129					
Per cent of total:					<b>Leather goods, 1909.....</b>	67	721	\$4,347,445	\$1,508,571
1909.....	100.0	100.0	100.0	100.0	Individual.....	33	117	384,933	200,401
1904.....	100.0	100.0	100.0	100.0	Firm.....	16	113	614,749	203,956
Individual:					Corporation.....	19	491	3,347,703	1,085,164
1909.....	49.9	13.2	8.5	12.7	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	53.1	14.9	10.9	15.1	Individual.....	49.3	10.2	8.9	13.9
Firm:					Firm.....	22.4	15.7	14.1	13.5
1909.....	19.8	8.8	0.8	9.0	Corporation.....	28.4	68.1	77.0	72.0
1904.....	19.9	9.8	9.0	10.0					
Corporation:					<b>Lumber and timber products, 1909.....</b>	799	23,518	\$32,201,440	\$21,197,337
1909.....	29.5	77.9	84.7	78.2	Individual.....	350	3,035	3,530,010	2,632,748
1904.....	26.0	75.2	79.8	74.1	Firm.....	207	3,238	4,004,336	3,343,077
Other:					Corporation.....	182	17,245	24,058,094	15,320,712
1909.....	0.8	0.1	0.1	0.1	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	0.4	0.1	0.3	0.2	Individual.....	43.8	12.9	11.0	12.0
<b>Bread and other bakery products, 1909.....</b>	385	1,301	\$5,310,785	\$2,248,540	Firm.....	33.4	13.8	14.3	15.8
Individual.....	324	607	2,817,158	1,192,510	Corporation.....	22.8	73.3	74.7	72.3
Firm.....	46	120	642,344	285,387					
Corporation <sup>1</sup> .....	15	505	1,851,283	770,637	<b>Oil, cottonseed, and cake, 1909.....</b>	194	3,073	\$29,815,772	\$6,478,711
Per cent of total.....	100.0	100.0	100.0	100.0	Individual.....	17	264	2,350,319	698,407
Individual.....	84.2	59.1	53.0	53.0	Firm.....	5	40	187,010	52,332
Individual.....	11.9	9.3	12.1	12.7	Corporation.....	172	2,779	27,377,843	5,725,912
Firm.....	3.9	40.6	34.9	34.3	Per cent of total.....	100.0	100.0	100.0	100.0
Corporation <sup>1</sup> .....					Individual.....	8.8	8.3	7.0	10.8
<b>Flour-mill and gristmill products, 1909.....</b>	238	1,216	\$32,484,612	\$3,827,971	Firm.....	2.0	1.3	0.0	0.8
Individual.....	81	144	2,585,772	312,743	Corporation.....	88.7	90.4	91.5	88.4
Individual.....	59	180	4,972,248	613,308					
Firm.....	59	180	4,972,248	613,308	<b>Printing and publishing, 1909.....</b>	1,067	4,408	\$11,587,255	\$8,780,015
Corporation.....	98	892	24,926,592	2,901,920	Individual.....	678	1,297	2,726,781	2,176,050
Per cent of total.....	100.0	100.0	100.0	100.0	Firm.....	193	778	1,685,550	1,283,067
Individual.....	34.0	11.8	8.0	8.2	Corporation.....	159	2,310	7,080,290	5,242,443
Individual.....	24.8	14.8	15.3	16.0	Other.....	82	23	94,022	70,465
Firm.....	41.2	73.4	70.7	75.8	Per cent of total.....	100.0	100.0	100.0	100.0
Corporation.....					Individual.....	93.5	20.4	23.5	24.3
<b>Foundry and machine-shop products, 1909.....</b>	143	2,925	\$8,067,941	\$4,208,470	Firm.....	18.6	17.6	14.5	14.6
Individual.....	59	303	779,857	400,598	Corporation.....	14.0	52.4	61.1	59.7
Individual.....	30	176	400,896	205,848	Other.....	3.0	0.5	0.8	0.9
Firm.....	54	2,446	6,707,188	3,452,024					
Corporation.....									

<sup>1</sup> Includes the group "Other," to avoid disclosure of individual operations.

For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available. Figures for 1909 only are presented for several important industries individually. In order to avoid disclosing the operations of individual concerns it is necessary to omit several important industries from this table and the one following.

The most important distinction shown is that between corporate and all other forms of ownership. For all industries combined, 29.5 per cent of the total number of establishments were in 1909 under corporate ownership, as against 70.5 per cent under all other forms. The corresponding figures for 1904 were 26.6 per cent and 73.4 per cent, respectively. In respect

to value of products, however, the establishments under corporate ownership are by far the most important. For all industries combined, as measured by value of products and value added by manufacture, as well as by number of establishments and average number of wage earners, corporate ownership gained ground during the five-year period. Among the important industries not shown in this table, it is worthy of note that all of the establishments engaged in steam-railroad car repair work and in the manufacture of cotton goods, and by far the larger number of those engaged in the brewery, rice cleaning and polishing, and slaughtering and meat-packing industries were under corporate ownership.

Size of establishment.—The tendency of manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the stand-

point of industrial organization. In order to throw some light upon it the following table groups the establishments according to the value of their products:

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>					<b>Foundry and machine-shop products, 1909—Continued.</b>				
1909.....	4,588	70,230	\$272,895,635	\$94,717,120	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	3,158	49,066	150,528,389	58,924,759	Less than \$5,000.....	28.0	1.9	1.4	1.8
Less than \$5,000:					\$5,000 and less than \$20,000.....	28.7	6.2	5.2	6.2
1909.....	1,746	2,646	4,297,098	2,943,755	\$20,000 and less than \$100,000.....	31.5	32.2	26.0	28.6
1904.....	1,220	1,675	2,086,301	2,173,851	\$100,000 and less than \$1,000,000.....	11.9	59.7	67.5	63.5
\$5,000 and less than \$20,000:					Average per establishment.....		20	\$56,410	\$20,430
1909.....	1,512	7,780	15,442,319	9,636,311					
1904.....	1,003	5,307	9,965,884	6,481,730	<b>Ice, manufactured, 1909.....</b>	182	1,437	\$3,844,120	\$2,752,277
\$20,000 and less than \$100,000:					1909.....	30	53	88,011	51,981
1909.....	808	15,724	39,117,172	19,593,400	1904.....	60	422	906,410	690,331
1904.....	640	12,398	28,587,387	13,725,925	\$5,000 and less than \$20,000.....	89	962	2,759,693	2,009,965
\$100,000 and less than \$1,000,000:					\$20,000 and less than \$100,000 <sup>2</sup> .....	63			
1909.....	426	34,894	111,984,740	43,621,809					
1904.....	278	21,438	69,958,763	27,653,294	Per cent of total.....	100.0	100.0	100.0	100.0
\$1,000,000 and over:					Less than \$5,000.....	16.5	3.7	2.3	1.9
1909.....	36	9,180	192,054,300	19,021,845	\$5,000 and less than \$20,000.....	48.9	29.4	25.9	25.1
1904.....	17	8,248	39,030,054	8,889,959	\$20,000 and less than \$100,000 <sup>2</sup> .....	31.6	66.9	71.8	73.0
Per cent of total:					Average per establishment.....		8	\$21,122	\$15,122
1909.....	100.0	100.0	100.0	100.0					
1904.....	100.0	100.0	100.0	100.0	<b>Leather goods, 1909.....</b>	67	721	\$4,347,445	\$1,508,571
Less than \$5,000:					1909.....	10	15	21,789	16,086
1909.....	38.1	3.8	1.6	3.1	\$5,000 and less than \$20,000.....	29	85	304,523	150,082
1904.....	38.6	3.4	2.0	3.7	\$20,000 and less than \$100,000.....	17	117	473,920	288,036
\$5,000 and less than \$20,000:					\$100,000 and less than \$1,000,000.....	11	504	3,554,213	1,127,927
1909.....	33.0	11.1	5.7	10.2	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	31.8	10.8	6.6	11.0	Less than \$5,000.....	14.9	2.1	0.6	1.1
\$20,000 and less than \$100,000:					\$5,000 and less than \$20,000.....	43.3	11.8	7.0	10.3
1909.....	18.9	22.4	14.3	20.7	\$20,000 and less than \$100,000.....	25.4	13.2	10.9	13.8
1904.....	20.3	25.3	19.0	23.3	\$100,000 and less than \$1,000,000.....	16.4	69.9	81.5	74.8
\$100,000 and less than \$1,000,000:					Average per establishment.....		11	\$64,887	\$22,516
1909.....	9.3	49.7	41.0	45.9					
1904.....	8.8	43.7	46.5	46.9	<b>Lumber and timber products, 1909.....</b>	799	23,518	\$32,201,440	\$21,197,137
\$1,000,000 and over:					1909.....	268	1965	677,573	535,117
1909.....	0.8	13.1	37.4	20.1	\$5,000 and less than \$20,000.....	277	2,536	2,895,585	2,167,892
1904.....	0.5	16.8	25.9	15.1	\$20,000 and less than \$100,000.....	171	5,100	7,321,010	4,828,269
Average per establishment:					\$100,000 and less than \$1,000,000 <sup>1</sup> .....	83	14,017	21,337,272	13,606,069
1909.....		15	\$50,480	\$20,645	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....		10	47,060	18,659	Less than \$5,000.....	33.5	4.1	2.1	2.5
<b>Bread and other bakery products, 1909.....</b>	385	1,391	\$5,310,785	\$2,248,540	\$5,000 and less than \$20,000.....	34.7	10.8	8.9	10.2
1909.....	163	93	443,254	192,032	\$20,000 and less than \$100,000.....	21.4	21.7	22.7	22.8
\$5,000 and less than \$20,000.....	173	448	1,752,040	782,050	\$100,000 and less than \$1,000,000.....	10.4	63.4	65.3	64.5
\$20,000 and less than \$100,000.....	45	403	1,675,177	670,329	Average per establishment.....		29	\$40,302	\$26,530
\$100,000 and less than \$1,000,000 <sup>1</sup> .....	4	447	1,540,314	604,123					
Per cent of total.....	100.0	100.0	100.0	100.0	<b>Oil, cottonseed, and cake, 1909.....</b>	194	3,073	\$20,915,772	\$6,476,711
Less than \$5,000.....	42.3	6.7	8.3	8.5	1909.....	13	45	185,727	46,674
\$5,000 and less than \$20,000.....	44.9	32.2	33.0	34.8	\$5,000 and less than \$20,000.....	13	45	185,727	46,674
\$20,000 and less than \$100,000.....	11.7	29.0	29.7	29.8	\$20,000 and less than \$100,000.....	84	864	5,611,685	1,785,847
\$100,000 and less than \$1,000,000 <sup>1</sup> .....	1.0	32.1	29.0	29.9	\$100,000 and less than \$1,000,000.....	93	1,405	19,283,293	4,283,539
Average per establishment.....		4	\$13,794	\$5,840	\$1,000,000 and over.....	4	259	4,835,067	960,651
<b>Flour-mill and gristmill products, 1909.....</b>	238	1,216	\$32,484,612	\$3,827,971	Per cent of total.....	100.0	100.0	100.0	100.0
1909.....	55	39	157,764	39,800	Less than \$5,000.....	6.7	1.5	0.6	0.7
\$5,000 and less than \$20,000.....	67	95	720,934	130,850	\$5,000 and less than \$20,000.....	43.3	28.1	18.8	18.3
\$20,000 and less than \$100,000.....	60	187	2,847,449	365,954	\$20,000 and less than \$100,000.....	47.9	62.0	64.5	66.1
\$100,000 and less than \$1,000,000.....	48	670	17,034,774	1,611,138	\$1,000,000 and over.....	2.1	8.4	10.2	14.8
\$1,000,000 and over.....	8	325	11,714,701	1,986,160	Average per establishment.....		10	\$154,205	\$33,385
Per cent of total.....	100.0	100.0	100.0	100.0	<b>Printing and publishing, 1909.....</b>	1,067	4,408	\$11,587,255	\$8,780,015
Less than \$5,000.....	23.1	3.2	0.5	0.9	1909.....	684	853	1,509,681	1,289,812
\$5,000 and less than \$20,000.....	28.2	7.8	2.2	3.4	\$5,000 and less than \$20,000.....	304	1,333	2,810,953	2,253,737
\$20,000 and less than \$100,000.....	25.2	15.4	8.8	9.6	\$20,000 and less than \$100,000.....	59	918	2,498,110	1,824,674
\$100,000 and less than \$1,000,000.....	20.2	46.9	52.4	49.9	\$100,000 and less than \$1,000,000.....	20	1,304	4,679,111	3,410,392
\$1,000,000 and over.....	8.4	26.7	36.1	36.2	Per cent of total.....	100.0	100.0	100.0	100.0
Average per establishment.....		6	\$130,490	\$16,084	Less than \$5,000.....	64.1	19.4	13.8	14.7
<b>Foundry and machine-shop products, 1909.....</b>	143	2,925	\$8,067,941	\$4,208,470	\$5,000 and less than \$20,000.....	28.5	30.2	21.3	25.7
1909.....	40	56	109,415	74,981	\$20,000 and less than \$100,000.....	5.5	20.8	21.6	20.8
\$5,000 and less than \$20,000.....	41	182	420,361	259,018	\$100,000 and less than \$1,000,000.....	1.9	29.6	40.4	38.8
\$20,000 and less than \$100,000.....	45	941	2,095,720	1,203,655	Average per establishment.....		4	\$10,860	\$8,229
\$100,000 and less than \$1,000,000.....	17	1,746	5,442,445	2,670,810					

<sup>1</sup> Includes the group "\$1,000,000 and over."

<sup>2</sup> Includes the group "\$100,000 and less than \$1,000,000."

The table also shows the average size of establishments for all industries combined and for important industries separately, as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the last two censuses, while for the individual industries figures are given for 1909 only.

This table shows that in 1909, of the 4,588 manufacturing establishments in the state, only 36, or eight-tenths of 1 per cent, had a value of products exceeding \$1,000,000. These establishments, however, had an average of 9,186 wage earners, or 13.1 per cent of the total number in all establishments, and reported 37.4 per cent of the total value of products, and 20.1 per cent of the total value added by manufacture.

On the other hand, the very small establishments—that is, those having a value of products of less than \$5,000—constituted a considerable proportion (38.1 per cent) of the total number of establishments, but the value of their products amounted to only 1.6 per cent of the total. The great bulk of the manufacturing was reported by establishments having a product valued at not less than \$100,000.

It will be seen from the table that during the five years from 1904 to 1909 there was a considerable increase as measured by value of products in the relative importance of the largest establishments—those reporting products of not less than \$1,000,000 in value—and a decrease in that of all other classes.

The fact that the average value of products per establishment increased from \$47,666 to \$59,480, and the average value added by manufacture from \$18,659 to \$20,645, can not be taken as in itself indicating a tendency toward concentration. The increased values shown may be, and probably are, due in part to the increase that has taken place in the prices of commodities. The average number of wage earners per establishment decreased from 16 to 15.

The table shows further that when the size of establishments is measured by the average value of products per establishment the bakery and the printing

and publishing industries are conducted in comparatively small establishments, while the flour-mills and gristmills and the cottouseed-oil mills are mainly large establishments. Among the important industries not shown in the table, the majority of the steam-railroad repair shops, cotton mills, breweries, rice mills, and slaughtering and meat-packing establishments are large.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The next table shows for 1909 such a classification for all industries combined and for 15 important industries individually, and gives not only the number of establishments falling into each group, but also the average number of wage earners employed.

Of the 4,588 establishments reported for all industries, 10.4 per cent employed no wage earners; 53.2 per cent, from 1 to 5; 23.7 per cent, from 6 to 20; and only 12.6 per cent, 21 and over. The most numerous single group consists of the 2,440 establishments employing from 1 to 5 wage earners, and the next of the 1,089 establishments employing from 6 to 20 wage earners. There were 36 establishments that employed over 250 wage earners; 3 of these employed over 1,000 each, of which 2 were slaughtering and meat-packing establishments and 1 a steam-railroad repair shop.

Of the total number of wage earners, 24.5 per cent were in establishments employing over 250 wage earners. The single group having the largest number of wage earners was the group comprising the establishments employing from 101 to 250 wage earners. This group employed 16,809 wage earners, or 23.9 per cent of the total. The individual industries listed in this table, but not in the preceding one, namely, steam-railroad repair shops and slaughtering and meat packing, are industries in which comparatively large establishments do most of the business, as appears from the classification according to the number of wage earners.

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING --								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All industries.....	4,588	470	2,440	1,089	319	117	108	25	8	9
Bread and other bakery products.....	385	83	250	40	4	1	1	1		
Brick and tile.....	80		10	40	20	3	1			
Cars and general shop construction and repairs by steam-railroad companies.....	62		2	11	9	12	15	8	4	1
Cotton goods, including cotton small wares.....	13		1			6	6			
Flour-mill and gristmill products.....	238	29	154	41	13	1				
Food preparations.....	23		10	0	4					
Foundry and machine-shop products.....	143	4	70	37	17	7	6	2		
Ice, manufactured.....	182		104	63	15					
Leather goods.....	07	3	43	11	6					
Liquors, malt.....	12		3	1	4		3			
Lumber and timber products.....	790	13	292	314	82	33	50	11	4	
Oil, cottonseed, and cake.....	194		23	128	37	5	1			
Printing and publishing.....	1,067	190	725	109	23	7	4			
Rice, cleaning and polishing.....	19		1	9	8					
Slaughtering and meat packing.....	14		3	3	3	1	2			2
All other industries.....	1,281	146	738	272	68	33	19	3		
AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	70,230		5,852	11,999	9,779	8,589	16,809	8,190	4,899	4,122
Bread and other bakery products.....	1,391		523	350	106		105	307		
Brick and tile.....	1,035		54	471	1,042	215	153			
Cars and general shop construction and repairs by steam-railroad companies.....	9,782		10	133	227	873	2,374	2,536	2,586	1,043
Cotton goods, including cotton small wares.....	1,590		20			507	1,063			
Flour-mill and gristmill products.....	1,216		309	421	421	65				
Food preparations.....	284		30	125	120					
Foundry and machine-shop products.....	2,925		165	448	502	457	793	599		
Ice, manufactured.....	1,437		314	652	471					
Leather goods.....	721		127	111	180	303				
Liquors, malt.....	765		10	16	24	314	401			
Lumber and timber products.....	23,518		913	3,447	2,520	2,538	8,179	3,617	2,304	
Oil, cottonseed, and cake.....	3,073		83	1,572	992	320	100			
Printing and publishing.....	4,408		1,590	1,107	641	495	575			
Rice, cleaning and polishing.....	430		3	130	240	57				
Slaughtering and meat packing.....	3,639		5	26	96	78	355			3,079
All other industries.....	13,116		1,716	2,970	2,188	2,367	2,765	1,170		
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	100.0		8.3	17.1	13.9	12.2	23.9	11.7	7.0	5.9
Bread and other bakery products.....	100.0		37.6	25.2	7.6		7.5	22.1		
Brick and tile.....	100.0		2.8	24.3	53.8	11.1	7.9			
Cars and general shop construction and repairs by steam-railroad companies.....	100.0		0.1	1.4	2.3	8.9	24.3	25.9	26.4	10.7
Cotton goods, including cotton small wares.....	100.0			1.3		31.9	65.9			
Flour-mill and gristmill products.....	100.0		25.4	34.6	34.6	5.3				
Food preparations.....	100.0		10.6	44.0	45.4					
Foundry and machine-shop products.....	100.0		5.6	15.3	17.2	15.6	27.1	10.1		
Ice, manufactured.....	100.0		21.9	45.4	32.8					
Leather goods.....	100.0		17.6	15.4	25.0	42.0				
Liquors, malt.....	100.0		1.3	2.1	3.1	41.0	52.4			
Lumber and timber products.....	100.0		3.9	14.7	10.7	10.8	34.8	15.4	9.8	
Oil, cottonseed, and cake.....	100.0		2.7	51.2	32.3	10.4	3.4			
Printing and publishing.....	100.0		36.1	25.1	14.5	11.2	13.0			
Rice, cleaning and polishing.....	100.0		0.7	30.2	55.8	13.3				
Slaughtering and meat packing.....	100.0		0.1	0.7	2.6	2.1	9.8			84.6
All other industries.....	100.0		13.1	22.6	16.7	18.0	20.6	8.9		

**Expenses.**—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses which make up the total.

The following table shows, for 1909, in percentages the distribution of expenses among the classes indicated, for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II, page 24.

This table shows that, for all industries combined, 72.8 per cent of the total expenses were incurred for materials, 19.9 per cent for services—that is, salaries and wages—and but 7.3 per cent for other purposes. As would be expected, these proportions vary greatly in the different industries.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries.....	4.4	15.5	72.8	7.3
Bread and other bakery products.....	4.0	14.9	67.8	13.3
Brick and tile.....	7.7	38.7	37.1	16.5
Cars and general shop construction and repairs by steam-railroad companies.....	5.4	56.3	41.5	2.8
Cotton goods, including cotton small wares.....	2.4	20.0	71.6	6.0
Flour-mill and gristmill products.....	1.9	2.2	92.9	3.1
Food preparations.....	1.8	2.2	93.6	2.3
Foundry and machine-shop products.....	8.1	27.5	55.1	9.3
Ice, manufactured.....	12.6	30.0	39.0	18.4
Leather goods.....	6.4	11.7	71.9	9.9
Liquors, malt.....	7.6	13.0	38.9	40.5
Lumber and timber products.....	5.4	42.0	39.8	12.8
Oil, cottonseed, and cake.....	3.2	4.8	86.2	5.8
Printing and publishing.....	18.0	30.2	30.4	21.5
Rice, cleaning and polishing.....	2.8	2.4	90.5	4.2
Slaughtering and meat packing.....	1.7	4.6	91.4	2.3
All other industries.....	4.7	12.3	76.3	6.6

**Engines and power.**—The following table shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 <sup>1</sup>	1909	1904	1899 <sup>1</sup>	1909	1904	1899
<b>Primary power, total</b> .....	6,232	2,408	2,067	282,471	164,637	116,157	100.0	100.0	100.0
Owned.....	3,789	2,408	2,067	207,167	160,164	113,495	94.6	97.3	97.7
<b>Steam</b> .....	2,955	1,973	1,839	249,475	155,312	110,943	88.3	94.3	95.5
Gas.....	802	403	199	15,745	1,876	968	5.6	1.1	0.8
Water wheels.....	31	20	20	1,880	2,276	1,557	0.7	1.4	1.3
Water motors.....	1	3	( <sup>2</sup> )	1	1	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Other.....				60	690	27	( <sup>2</sup> )	0.4	( <sup>2</sup> )
Rented.....	2,443	( <sup>2</sup> )	( <sup>2</sup> )	15,304	4,473	2,662	5.4	2.7	2.3
<b>Electric</b> .....	2,443	( <sup>2</sup> )	( <sup>2</sup> )	14,868	4,414	2,390	5.3	2.7	2.1
Other.....				436	59	272	0.2	( <sup>2</sup> )	0.2
<b>Electric motors</b>	3,464	410	54	36,450	10,299	3,217	100.0	100.0	100.0
Run by current generated by establishment.....	1,011	410	54	21,582	5,885	827	59.2	57.1	25.7
Run by rented power.....	2,443	( <sup>2</sup> )	( <sup>2</sup> )	14,868	4,414	2,390	40.8	42.9	74.3

<sup>1</sup> Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.  
<sup>2</sup> Not reported.  
<sup>3</sup> Less than one-tenth of 1 per cent.

The amount of primary power used in the manufacturing industries of Texas increased 48,480 horsepower, or 41.7 per cent, from 1899 to 1904, and 117,834 horsepower, or 71.6 per cent, from 1904 to 1909. The greater part of these increases was in power generated by steam engines, 91.5 per cent of the total increase from 1899 to 1904 and 79.9 per cent of the total increase from 1904 to 1909 being of this kind, although the proportion which steam power formed of the total primary power reported decreased from 95.5 per cent in 1899 to 88.3 per cent in 1909.

There was an increase in every form of primary

power from 1904 to 1909 except water power and other "Owned power," both of which show a decrease. The more general use of gas engines is shown, there being 802 such engines, with an indicated capacity of 15,745 horsepower, reported in 1909, as against 403 engines with 1,876 horsepower in 1904, and 199 engines with 968 horsepower in 1899. The figures also show that the practice of renting electric power is increasing, 5.3 per cent of the total power being of this character in 1909, as against but 2.7 per cent in 1904 and 2.1 per cent in 1899. The use of electric motors for the purpose of applying the power generated within the manufacturing establishments reporting is also shown to be rapidly growing, the horsepower of such motors increasing from 827 in 1899 to 5,885 in 1904 and 21,582 in 1909.

**Fuel.**—Closely related to the question of kind of power employed is that of the fuel consumed in generating this power, or otherwise used as material in the manufacturing processes. The table following shows the quantity of each kind of fuel used in 1909, for all industries combined and for certain selected industries.

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gasoline (barrels).	Gas (1,000 feet).
<b>All industries</b> <sup>1</sup> .....	21,164	886,261	86,862	182,241	3,500,798	714,292
Bread and other bakery products.....	101	5,112	780	14,061	5,230	20,384
Brick and tile.....		118,797		63,305	250,625	87,868
Cars and general shop construction and repairs by steam-railroad companies.....	598	68,085	3,330	1,826	233,947	15,166
Cotton goods, including cotton small wares.....		28,540			16,981	
Flour-mill and gristmill products.....		65,025		3,387	75,315	4,700
Food preparations.....	455	3,937		31	7,228	168
Foundry and machine-shop products.....	202	13,180	10,075	4,003	15,025	32,901
Gas, illuminating and heating.....	7,630	31,985	7,322	6	99,621	241,102
Ice, manufactured.....	6,781	191,604		19,112	310,632	78,305
Leather goods.....		264		62	62	6
Liquors, malt.....		8,608		60	182,352	
Lumber and timber products.....	2,661	18,026		13,821	6,874	5,857
Oil, cottonseed, and cake.....	1,359	159,919		9,254	271,488	43,560
Printing and publishing.....	285	3,174	75	647	2,728	8,931
Rice, cleaning and polishing.....		30		325	29,951	
Slaughtering and meat packing.....		21,639		300	383,902	
All other industries.....	792	146,830	59,271	51,981	1,610,434	175,344

<sup>1</sup> In addition there were 12,946 tons of other varieties of fuel reported.

## SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

(With statistics for laundries and custom gristmills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and cost of materials and the quantity and value of products and other information for securing which no provision is made on the general schedule. Data of this character for six important industries in Texas are here presented.

**Slaughtering and meat packing.**—This industry, which is one of the youngest in the state, shows remarkable development during the decade 1899-1909 in every respect. As late as the census of 1889 there were no wholesale slaughtering or meat-packing establishments reported for the state, and only four independent sausage factories with products valued at \$42,000. Important factors in the growth of this industry in Texas have been that most of the animals slaughtered were raised in the state and that the rapidly increasing population has created a demand for home-grown meats which did not formerly exist.

The following tabular statement gives the quantity and cost of the chief materials used and the quantity and value of the various products for 1909, 1904, and 1899:

MATERIAL OR PRODUCT.	1909	1904	1899
<b>Materials used, total cost</b> .....	\$37,409,785	\$13,593,181	\$3,170,536
Beeves slaughtered:			
Number.....	527,469	285,205	24,375
Cost.....	\$15,089,886	\$6,051,742	\$590,514
Calves slaughtered:			
Number.....	234,172	94,093	7,544
Cost.....	\$2,074,188	\$603,625	\$60,205
Sheep slaughtered:			
Number.....	77,805	49,831	6,649
Cost.....	\$315,696	\$165,281	\$18,311
Hogs slaughtered:			
Number.....	939,674	347,040	208,276
Cost.....	\$10,933,088	\$3,218,450	\$1,880,067
Dressed meat, purchased.....	\$1,110,042	\$660,107	\$178,738
Fuel and rent of power.....	\$388,795	\$195,687	\$53,868
All other materials.....	\$7,498,090	\$2,608,289	\$373,843
<b>Products, total value</b> .....	\$42,529,746	\$15,620,931	\$3,904,491
Beef, fresh:			
Pounds.....	208,086,588	105,988,208	10,795,352
Value.....	\$12,408,125	\$4,954,013	\$588,996
Beef, salted or cured:			
Pounds.....	1,483,100	2,020,874	2,000
Value.....	\$115,810	\$144,727	\$300
Veal, fresh:			
Pounds.....	20,308,086	9,674,766	973,612
Value.....	\$2,023,883	\$598,938	\$67,542
Mutton, fresh:			
Pounds.....	2,846,112	1,670,045	266,414
Value.....	\$260,574	\$127,578	\$22,040
Pork, fresh:			
Pounds.....	32,054,404	9,596,282	5,133,863
Value.....	\$3,195,006	\$713,540	\$333,958
Pork, salted or cured:			
Pounds.....	71,219,957	20,259,612	22,945,343
Value.....	\$7,648,463	\$2,406,940	\$1,711,340
Sausage, fresh or cured.....	\$1,088,114	\$436,890	\$123,939
All other fresh meat:			
Pounds.....	2,052,042	9,523,500	530,400
Value.....	\$254,877	\$380,941	\$30,580
Lard:			
Pounds.....	60,862,980	38,977,525	6,475,327
Value.....	\$5,644,149	\$2,748,909	\$416,654
Tallow, oleo stock, and stearin:			
Pounds.....	2,251,373	( <sup>2</sup> )	( <sup>2</sup> )
Value.....	\$179,701	( <sup>2</sup> )	( <sup>2</sup> )
Fertilizers and fertilizer materials:			
Tons.....	15,303	5,565	553
Value.....	\$435,004	\$141,268	\$6,424
Hides:			
Number.....	608,452	304,896	31,908
Pounds.....	27,478,391	17,706,404	1,379,101
Value.....	\$3,750,416	\$1,565,481	\$118,067
Pelts:			
Number.....	77,861	49,831	( <sup>2</sup> )
Value.....	\$54,629	\$31,315	( <sup>2</sup> )
Amount received for custom or contract work.....	\$39,537	\$920	.....
All other products.....	\$5,431,449	\$1,369,462	\$484,651

<sup>1</sup> Two establishments excluded, to avoid disclosure of individual operations.  
<sup>2</sup> Included in "All other products."

There were 242,174, or 84.9 per cent, more beeves slaughtered in 1909 than in 1904; 140,079, or 148.9 per cent, more calves; 27,974, or 56.1 per cent, more sheep; and 592,634, or 170.8 per cent, more hogs. In each case, however, the increase in cost was relatively much greater than the increase in number.

From 1904 to 1909 the quantity of each of the different classes of meat products, with the exception of those included under the head of "Beef, salted or cured," and "All other fresh meat," increased decidedly, the most conspicuous gains being 234 per cent in fresh pork and 202.9 per cent in fresh veal. The most pronounced absolute gain was that of 102,098,320 pounds in fresh beef, representing a relative increase, however, of only 96.3 per cent. Pork, salted or cured, which was next to fresh beef in quantity reported, shows an increase of 44,960,543 pounds, or 171.2 per cent. The percentages of increase in values are somewhat greater than those in the quantities of meat products, on account of the higher prices of meats prevailing in 1909 than in 1904. Of the remaining products shown separately, lard was the largest, both in quantity and in value, with an increase during the five-year period 1904-1909 of 56.1 per cent and 105.3 per cent, respectively. The value of the products included under "All other products" shows the extraordinary gain of nearly 300 per cent during the same period, which was due almost entirely to the increased production of lard substitutes.

**Flour-mill and gristmill products.**—In 1909 the cereal crop was light, and the prices of grain were somewhat above the normal. The following tabular statement shows the quantity and value of the principal products for 1909 and 1904:

PRODUCT.	QUANTITY.		VALUE.	
	1909	1904	1909	1904
<b>Total value</b> .....			\$32,484,612	\$22,083,136
Wheat flour:				
White..... barrels..	3,330,479	3,223,300	19,110,676	16,466,591
Graham..... barrels..	2,556	4,900	14,158	25,229
Corn meal and corn flour, barrels..	877,314	599,375	2,875,994	1,477,014
Rye flour..... barrels..	1,551	540	9,663	2,660
Hominy and grits..... pounds..	198,000	128,000	3,529	1,920
Feed..... tons.....	280,168	61,377	7,325,154	1,371,374
Offal..... tons.....	120,122	139,496	3,104,771	2,705,334
All other products.....			41,270	33,014

An increase is shown in the quantity of each class of products except Graham flour and offal. The chief product, white flour, showed the smallest relative increase in quantity, 3.6 per cent, but an increase of 16.1 per cent in value. There were gains both in quantity (46.4 per cent) and in value (94.7 per cent) of corn meal and corn flour combined. The large increase in the tonnage of feed, 218,791 tons, or 356.5 per cent, was accompanied by a comparatively small decrease in the quantity of offal, 19,374 tons, or 13.9 per cent. "Offal" largely consists of the by-products obtained in the manufacture of wheat flour. Although

offal, like feed, is used for animal consumption, it is distinguished from "Feed" as reported in the table in that the latter is largely manufactured from corn and is a primary product of the mills.

The mills were equipped in 1909 with 1,781 pairs of rolls, 187 runs of stone, and 2 attrition mills. Eight establishments manufactured the barrels, and 11 the sacks used as containers for marketing their product.

**Lumber and timber products.**—Texas ranked seventh among the states of the Union in the cut of lumber in 1909. The following is a statement of the three main classes of products of the sawmill branch of the industry for 1909 and 1899:

PRODUCT.		QUANTITY.	
		1909	1899
Rough lumber.....	M feet b. m.....	2,099,130	1,232,404
Shingles.....	thousands.....	137,719	210,633
Lath.....	thousands.....	59,027	4,181

The production of rough lumber increased 70.3 per cent during the decade 1899-1909, while that of shingles decreased 34.6 per cent. More than thirteen times the quantity of lath was reported in 1909 as in 1899. Of the total cut of 2,099,130 M feet board measure, in 1909, 2,021,617 M feet was softwoods, of which the shortleaf yellow pine, with 2,019,423 M feet, contributed the greater part. Of the 77,513 M feet of hardwoods cut, 47,252 M feet, or 61 per cent, was oak.

**Oil, cottonseed, and cake.**—In 1909 Texas produced a greater amount of cottonseed oil than any other state in the Union, contributing 21.2 per cent of the total production in the United States during that census year.

The following table shows the quantity of cotton seed crushed and the quantities of crude products manufactured, in 1909, 1904, and 1899:

MATERIAL OR PRODUCT.	QUANTITY.		
	1909	1904	1899
Cotton seed crushed.....	916,374	864,767	692,604
Crude products manufactured:			
Oil.....	33,497,933	32,239,649	24,354,695
Meal and cake.....	305,791	340,709	252,983
Hulls.....	340,528	337,233	328,119
Linters.....	46,994,462	33,307,490	15,544,379

The totals presented pertain to all cotton seed crushed, and to the crude products manufactured, whether sold as such or used as intermediate products in further processes of manufacture, such as the refining of oil and the mixing of fertilizer and feed.

The average amount of seed crushed per mill has fallen off from census to census during the last decade, being 6,790 tons in 1899, 5,579 tons in 1904, and 4,773 tons in 1909. The total quantity crushed increased, however, from 692,604 tons in 1899 to 916,374 tons in 1909, or 32.3 per cent. Of the 192 mills reported in

1909 as crushing seed, 18 crushed less than 1,000 tons each during the census year; 21 crushed 1,000 tons but less than 2,000; 86 crushed 2,000 tons but less than 5,000; 51 crushed 5,000 tons but less than 10,000; 13 crushed 10,000 tons but less than 20,000; and 3 crushed 20,000 tons and over.

There has been a continuous increase since 1899 in the total quantity of each of the several products, though that in hulls was very small. In proportional weight, hulls decreased from 947.5 pounds per ton of seed crushed in 1899 to 743.2 pounds per ton in 1909; meal and cake increased from 730.5 pounds per ton in 1899 to 863.8 pounds in 1909; linters increased from 22.4 pounds per ton in 1899 to 51.3 pounds in 1909; and the quantity of crude oil increased from 35.2 gallons per ton of seed crushed in 1899 to 36.6 gallons in 1909.

**Printing and publishing.**—This industry as a whole shows considerable growth in Texas during the last 10 years as measured by the financial statistics, and likewise by the general increase in the number of publications and aggregate circulation during the same period, as shown by the following table, in which the number of the various classes of publications and the aggregate circulation per issue are presented for 1909, 1904, and 1899:

PERIOD OF ISSUE.	NUMBER OF PUBLICATIONS.			AGGREGATE CIRCULATION PER ISSUE.		
	1909	1904	1899	1909	1904	1899
Total.....	962	817	766	2,180,622	1,762,692	1,054,761
Daily.....	99	87	83	330,602	245,370	147,002
Sunday.....	30	20	34	302,180	223,160	(1)
Semiweekly.....	28	18	22	205,816	227,900	101,392
Weekly.....	728	629	579	964,524	834,434	732,867
Monthly.....	64	54	33	256,700	211,929	61,400
All other classes.....	13	9	5	61,131	19,900	11,500

<sup>1</sup>Included in circulation for daily.

<sup>2</sup>Includes one triweekly.

During the 10-year period the number of publications increased 206, or 27.2 per cent, while the aggregate circulation per issue increased 1,126,161, or 106.8 per cent. The weekly publications are by far the most important class in the state, measured either by number or by aggregate circulation per issue, and in both respects they showed a substantial increase during each of the five-year periods. All of the other classes of publications showed large gains in their aggregate circulation for both five-year periods, although the number of Sunday and semiweekly publications decreased somewhat between 1899 and 1904. Most of the publications were printed in English, but there were 29 in German, including 1 German and English; 20 in Spanish, including 2 Spanish and English; 4 in Bohemian; and 2 each in Swedish and Italian.

**Rice, cleaning and polishing.**—The growth of this industry in Texas has been phenomenal. In 1899 there was only 1 establishment engaged in the cleaning and polishing of rice, while in 1909 the number was 19 and the quantity of rice treated amounted to

38.1 per cent of the total for the country. Ten of the establishments were engaged in merchant milling only, while 9 did both merchant and custom milling, treating 42,871,365 pounds on a custom basis.

The total quantity of rice milled (both merchant and custom), and the quantities of the various products, for the census years 1909 and 1904, are shown in the following tabular statement:

MATERIAL OR PRODUCT.	QUANTITY (POUNDS).	
	1909	1904
Rough rice, milled.....	371,816,370	316,170,405
Products manufactured:		
Clean rice.....	236,117,295	197,433,320
Whole.....	156,877,908	102,812,830
Broken.....	79,239,387	94,620,481
Polish.....	10,402,638	9,500,830
Bran.....	33,505,946	40,772,421
Hulls.....	43,717,550	168,463,834

<sup>1</sup> Includes waste.

The total quantity of rice milled increased 55,645,965 pounds, or 17.6 per cent, during the five-year period. The proportion of whole rice in the total amount of clean rice increased from 52.1 per cent to 66.4 per cent. A change in the varieties of rice grown and improvements in methods of treatment account largely for the greater proportional output of whole rice in 1909, as compared with 1904, and a relatively smaller production of broken rice. The decided decreases in the quantities of bran and hulls are due, to some extent, to the use of the former of these products in 1909 in the manufacture of feed and to the inclusion of waste with hulls in 1904.

**Laundries.**—Statistics for steam laundries are not included in the general tables or in the totals for manufacturing industries. In 1909 there were 127 such establishments in Texas, 66 of which were in cities of 10,000 inhabitants or more. The following statement summarizes the statistics:

Number of establishments.....	127
Persons engaged in the industry.....	3,514
Proprietors and firm members.....	150
Salaried employees.....	291
Wage earners (average number).....	3,073
Primary horsepower.....	3,195
Capital.....	\$2,005,200
Expenses.....	2,629,766
Services.....	1,554,999
Materials.....	471,421
Miscellaneous.....	603,346
Amount received for work done.....	3,220,315

The most common form of ownership was the individual, with 50 establishments. The firm and corporate forms of ownership were represented by 41 and 36 establishments, respectively. Twenty-nine establishments had receipts for the year's business of less than \$5,000; 48, \$5,000 but less than \$20,000; 44,

\$20,000 but less than \$100,000; and 6, \$100,000 but less than \$1,000,000.

The number of wage earners employed each month and the per cent which this number represented of the greatest number employed in any month were as follows:

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	2,791	85.0	July.....	3,232	98.4
February.....	2,847	86.7	August.....	3,284	100.0
March.....	2,891	88.0	September.....	3,277	99.3
April.....	2,976	90.0	October.....	3,172	96.6
May.....	3,048	92.8	November.....	3,112	94.8
June.....	3,160	96.2	December.....	3,090	94.1

The different kinds of primary power, the number of engines or motors, and the horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines or motors.	Horse-power.
<b>Primary power, total.....</b>		<b>3,195</b>
Owned:		
Steam.....	120	2,865
Gas.....	3	57
Rented:		
Electric.....	112	263
Other.....		10

The kind and amount of fuel used are shown in the following statement:

KIND.	Unit.	Quantity.
Anthracite coal.....	Tons.....	4
Bituminous coal.....	Tons.....	41,990
Coke.....	Tons.....	51
Wood.....	Cords.....	4,275
Oil.....	Barrels.....	17,410
Gas.....	1,000 feet.....	67,086

**Custom sawmills and gristmills.**—Statistics for custom sawmills and gristmills are not included in the general tables or in the totals for manufacturing industries. Those for custom sawmills, of which there are only two, can not be shown without disclosing individual operations, but those for custom gristmills are presented in the following summary:

Number of establishments.....	412
Persons engaged in the industry.....	969
Proprietors and firm members.....	561
Salaried employees.....	4
Wage earners (average number).....	494
Primary horsepower.....	14,331
Capital.....	\$449,944
Expenses.....	785,444
Services.....	29,162
Materials.....	1,745,361
Miscellaneous.....	10,921
Value of products.....	1,024,427

<sup>1</sup> Includes estimate of all grain ground.

MANUFACTURES—TEXAS.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.

THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salarii employees.	Wage-earners (average number).							
Expressed in thousands.													
<b>STATE—All industries.....</b>	1909	4,588	84,575	4,496	9,840	70,230	282,471	\$216,876	\$10,808	\$37,007	\$178,179	\$272,896	\$94,717
	1904	3,168	57,892	3,073	5,763	49,066	164,637	115,665	6,118	24,469	91,004	150,528	58,924
	1899	3,107	57,892	2,861	2,861	38,804	110,167	63,656	2,919	16,012	54,388	92,894	38,506
Bread and other bakery products.....	1909	385	2,078	431	256	1,391	1,281	4,093	180	071	3,032	5,311	2,249
	1904	244	1,198	270	77	851	473	1,276	66	395	1,752	3,040	1,207
	1899	178	670	187	26	467	.....	443	16	220	685	1,303	618
Brick and tile.....	1909	80	2,135	50	150	1,035	7,488	3,607	158	797	700	2,545	1,779
	1904	92	1,460	71	81	1,308	3,397	1,000	74	470	366	1,305	930
	1899	143	1,804	161	64	1,579	.....	1,293	51	420	235	1,020	785
Butter, cheese, and condensed milk.....	1909	36	143	30	20	84	477	309	15	40	530	660	130
	1904	10	19	12	2	5	62	34	1	4	40	63	14
	1899	12	30	9	3	18	84	42	2	9	51	81	30
Canning and preserving.....	1909	19	217	12	47	158	243	340	53	45	201	498	297
	1904	20	150	16	15	110	227	128	7	23	208	332	124
	1899	17	158	14	12	132	.....	101	9	33	120	226	106
Carriages and wagons and materials.....	1909	50	522	54	56	412	374	641	63	207	310	830	511
	1904	34	261	41	9	211	118	286	9	124	130	368	238
	1899	58	.....	.....	8	290	.....	386	7	150	180	506	326
Cars and general shop construction and repairs by steam-railroad companies.....	1909	62	10,527	.....	745	9,782	7,335	9,302	717	6,715	5,546	13,359	7,813
	1904	47	9,025	.....	432	8,593	3,735	4,500	499	5,370	4,476	10,473	5,097
	1899	56	6,896	.....	293	6,633	3,158	3,731	292	4,005	3,879	8,315	4,436
Clothing, men's, including shirts.....	1909	25	1,119	16	111	902	350	1,557	113	312	1,007	1,750	752
	1904	16	765	10	65	690	73	744	81	179	672	1,205	533
	1899	.....	.....	.....	39	594	.....	527	43	149	379	685	366
Confectionery.....	1909	40	967	48	202	717	607	1,402	207	218	1,459	2,451	992
	1904	23	588	22	77	489	338	893	74	147	608	1,155	487
	1899	19	.....	.....	58	334	.....	294	41	136	425	1,155	347
Cooperage and wooden goods, not elsewhere specified.....	1909	11	274	10	21	243	346	446	25	98	488	719	231
	1904	20	286	21	30	235	540	574	35	127	405	741	246
	1899	17	.....	.....	11	184	.....	173	14	64	198	341	143
Copper, tin, and sheet-iron products.....	1909	168	995	180	82	733	211	1,251	84	532	1,081	2,214	1,133
	1904	75	586	80	32	465	49	467	33	300	595	1,195	630
	1899	66	.....	.....	18	327	.....	320	15	184	369	754	385
Cotton goods, including cotton small wares.....	1909	13	1,633	.....	43	1,590	4,835	4,283	61	591	1,793	2,815	1,022
	1904	13	1,029	.....	30	993	3,452	2,729	36	270	1,018	1,587	599
	1899	4	1,005	.....	21	984	2,650	2,227	31	254	641	1,200	559
Flour-mill and gristmill products.....	1909	238	1,809	225	458	1,216	20,765	13,210	572	600	28,657	32,485	3,828
	1904	154	1,430	152	292	986	16,249	7,785	347	328	18,963	22,983	3,120
	1899	120	.....	.....	133	682	10,452	3,083	144	387	10,604	11,949	1,855
Food preparations.....	1909	23	367	17	66	284	1,322	1,278	80	108	4,580	5,220	640
	1904	11	182	10	19	153	135	132	13	51	209	375	166
	1899	7	32	12	1	19	.....	34	1	0	0	52	21
Foundry and machine-shop products.....	1909	143	3,441	134	382	2,025	5,287	8,241	500	1,925	3,859	8,068	4,209
	1904	111	2,379	109	187	2,080	2,781	4,904	244	1,268	2,392	5,179	2,877
	1899	105	1,666	100	125	1,432	.....	2,910	141	771	1,238	2,818	1,580
Furniture and refrigerators.....	1909	25	799	20	78	791	1,870	1,704	69	331	765	1,512	747
	1904	15	324	10	20	294	429	293	21	147	293	491	288
	1899	18	171	5	14	152	247	145	12	61	78	185	107
Gas, illuminating and heating.....	1909	27	746	3	168	575	1,090	6,202	138	288	545	1,644	1,090
	1904	19	246	1	81	164	325	2,231	78	103	197	719	522
	1899	11	112	.....	41	71	130	1,704	46	46	94	380	286
Ice, manufactured.....	1909	182	1,874	82	355	1,437	20,005	8,397	354	830	1,092	3,844	2,762
	1904	125	1,144	50	216	899	18,458	5,140	197	451	573	2,081	1,511
	1899	77	824	35	171	618	8,049	2,561	125	365	320	1,184	864
Leather goods.....	1909	67	1,012	68	223	721	601	3,269	253	463	2,839	4,347	1,508
	1904	60	656	61	147	748	297	2,058	147	474	2,054	3,365	1,311
	1899	72	.....	.....	105	880	.....	2,040	92	398	1,672	2,707	1,035
Lime.....	1909	11	386	7	31	348	534	517	34	123	143	390	247
	1904	6	126	8	2	116	160	94	1	43	47	134	87
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Liquors, malt.....	1909	12	931	6	160	745	7,817	7,027	323	566	1,695	6,464	4,760
	1904	10	740	2	112	626	4,753	5,150	231	412	1,055	4,154	3,050
	1899	9	685	2	98	585	5,771	4,439	181	355	647	2,090	2,043
Lumber and timber products.....	1909	799	25,843	985	1,340	23,518	88,031	45,552	1,484	11,002	11,004	32,201	21,197
	1904	391	16,101	437	1,041	14,023	43,022	20,452	1,174	6,500	4,955	18,880	13,025
	1899	559	.....	.....	493	12,455	34,433	12,904	465	4,841	8,429	17,782	9,353
Marble and stone work.....	1909	107	881	147	129	605	1,016	963	92	425	502	1,443	641
	1904	53	457	68	43	346	586	395	29	223	309	778	478
	1899	56	.....	.....	51	362	.....	347	29	243	301	853	552
Mattresses and spring beds.....	1909	50	334	50	51	233	587	680	46	118	362	658	296
	1904	27	365	32	22	311	488	410	19	124	400	667	297
	1899	17	.....	.....	8	147	.....	162	6	50	162	295	133

<sup>1</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.  
<sup>2</sup> Excluding statistics for two establishments, to avoid disclosure of individual operations.  
<sup>3</sup> Not reported separately.

MANUFACTURES—TEXAS.

TABLE I—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.  
THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employees.	Wage earners (average number).							
<b>STATE—Continued.</b>													
Oil, cottonseed, and cake.....	1909 1904 1899	191 157 103	3,923 3,368 2,809	30 15 15	811 614 376	3,073 2,739 2,478	45,185 33,900 21,560	\$21,506 14,180 7,987	\$879 578 375	\$1,296 1,020 831	\$23,439 15,805 10,373	\$29,916 18,699 14,005	\$6,477 2,894 3,632
Patent medicines and compounds and druggists' preparations.....	1909 1904 1899	59 38 32	382 200 200	49 46 46	188 60 22	145 103 85	51 17 17	747 534 183	183 65 27	62 35 34	411 211 118	1,014 700 359	683 459 241
Pottory, terra-cotta, and fire-clay products.....	1909 1904 1899	17 22 28	475 253 318	12 24 31	43 11 7	420 218 280	923 500 370	795 178 263	46 10 7	183 91 77	195 70 44	597 327 192	492 257 148
Printing and publishing.....	1909 1904 1899	1,067 1,850 776	7,177 5,288 776	1,150 970 970	1,610 874 331	4,408 3,441 2,561	4,392 2,756 2,561	9,127 6,107 3,341	1,650 729 335	2,785 2,071 1,309	2,807 1,793 975	11,587 7,830 4,605	8,780 6,067 3,631
Rice, cleaning and polishing.....	1909 1904 1899	19 17 17	643 600 600	22 6 6	101 171 171	430 432 432	6,274 4,500 4,500	3,820 2,139 2,139	224 225 225	189 212 212	7,122 3,508 3,508	8,142 4,640 4,640	1,020 1,132 1,132
Salt.....	1909 1904 1899	6 7 3	181 193 202	3 2 11	16 10 101	162 172 101	447 497 327	506 331 327	18 19 17	82 74 66	216 195 141	407 351 257	191 156 116
Slaughtering and meat packing.....	1909 1904 1899	44 39 312	4,248 2,354 469	2 1 6	608 333 49	3,639 2,019 1,141	11,330 2,086 1,640	12,438 6,375 1,232	668 323 62	1,902 806 180	37,410 13,593 3,171	42,530 15,621 3,901	5,420 2,028 731
Tobacco manufactures.....	1909 1904 1899	67 86 70	428 457 419	74 100 94	15 10 22	339 347 303	7 7 7	313 285 227	19 16 18	141 159 133	182 211 263	509 550 526	327 349 323
All other industries.....	1909 1904 1899	554 396 447	7,995 5,347 5,347	562 407 407	1,184 823 280	6,249 4,317 3,357	31,472 19,558 19,558	42,078 23,063 9,318	1,439 737 316	3,614 2,199 1,183	31,192 14,521 9,135	46,748 21,398 12,917	12,646 6,877 3,842

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

<b>DALLAS—All industries.....</b>	1909 1904 1899	305 247 177	6,621 4,486 2,842	249 211 500	1,400 830 500	4,882 3,445 2,842	13,808 10,891 6,462	\$17,688 10,891 6,462	\$1,831 828 515	\$2,604 1,759 1,323	\$16,966 9,297 5,398	\$26,959 16,628 9,488	\$9,993 6,421 4,090
Bread and other bakery products.....	1909 1904 1899	21 17 7	506 221 36	24 21 0	98 30 27	384 170 27	483 236 27	990 236 27	85 27 15	116 78 44	894 451 95	1,496 693 95	692 242 51
Clothing, men's, including shirts.....	1909 1904 1899	3 3 3	229 195 42	3 3 3	17 18 3	209 174 36	38 174 36	180 231 6	20 18 5	55 44 8	230 241 14	377 458 31	147 217 20
Confectionery.....	1909 1904 1899	5 5 5	204 162 162	6 5 5	47 21 136	152 136 136	273 280 280	297 280 280	65 18 43	52 43 213	280 213 377	570 377 164	281 164 164
Copper, tin, and sheet-iron products.....	1909 1904 1899	14 12 7	169 121 7	11 0 4	28 13 4	130 99 46	82 171 46	304 171 52	33 15 7	102 95 28	270 163 40	483 298 120	291 135 74
Foundry and machine-shop products.....	1909 1904 1899	14 16 3	839 677 297	9 13 6	130 59 26	691 505 265	1,054 1,839 136	2,512 1,839 916	237 84 36	420 309 316	1,033 692 316	2,130 1,602 673	1,067 910 357
Ice, manufactured.....	1909 1904 1899	7 4 3	133 53 120	..... 1 .....	27 12 68	106 40 68	2,771 ..... .....	761 479 371	37 17 26	66 26 28	77 41 47	276 140 150	199 108 103
Leather goods.....	1909 1904 1899	6 10 9	403 403 403	..... 3 .....	106 72 70	207 328 378	329 ..... .....	1,569 1,261 1,187	139 83 63	173 204 171	1,518 980 678	2,262 1,516 1,063	744 556 385
Lumber and timber products.....	1909 1904 1899	11 10 3	251 245 93	12 8 3	26 22 6	213 215 84	405 ..... .....	379 256 61	36 27 6	153 107 58	437 237 82	720 475 175	284 238 93
Marble and stone work.....	1909 1904 1899	8 3 6	96 27 100	10 5 8	13 1 8	73 24 87	208 ..... .....	155 35 59	6 1 9	58 17 64	102 28 64	160 42 239	102 31 175
Patent medicines and compounds and druggists' preparations.....	1909 1904 1899	18 11 7	171 127 49	13 11 6	81 62 7	77 54 36	25 ..... .....	468 454 47	105 64 10	30 15 13	268 185 49	593 514 138	325 324 89
Printing and publishing.....	1909 1904 1899	88 74 42	1,286 879 453	80 68 41	469 337 128	731 474 284	760 ..... .....	1,770 1,293 591	529 233 138	461 336 108	802 412 238	2,927 1,817 965	2,125 1,465 727
Tobacco manufactures.....	1909 1904 1899	5 7 0	30 51 102	7 12 15	1 2 11	31 37 76	7 ..... .....	36 28 21	1 2 5	13 27 26	18 62 42	50 62 109	32 35 67
All other industries.....	1909 1904 1899	105 74 72	2,304 1,425 1,425	66 55 185	441 181 185	1,797 1,189 1,455	7,373 ..... .....	8,297 4,843 3,124	528 239 210	905 499 562	11,093 5,557 3,778	14,015 7,005 5,727	3,852 2,048 1,949

<sup>1</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.  
<sup>2</sup> Figures can not be shown without disclosing individual operations.  
<sup>3</sup> Excluding statistics for two establishments, to avoid disclosure of individual operations.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employes.	Wage earners (average number).							
Expressed in thousands.													
<b>HOUSTON—All Industries</b> .....	1909	249	6,289	226	725	5,338	14,866	\$16,594	\$994	\$3,260	\$14,321	\$23,016	\$8,695
	1904	209	5,072	201	415	5,066	.....	8,877	532	2,892	7,617	13,564	5,947
	1899	145	.....	.....	245	3,188	.....	5,627	292	1,656	4,195	7,402	3,297
Bread and other bakery products.....	1909	23	262	22	10	221	92	980	22	114	412	724	312
	1904	20	182	23	11	148	.....	230	10	67	228	447	210
	1899	14	60	15	2	43	.....	49	1	26	70	131	61
Brick and tile.....	1909	3	93	2	2	89	150	126	2	40	32	99	67
	1904	5	106	4	3	99	.....	90	4	35	25	79	54
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Carriages and wagons and materials.....	1909	11	120	11	10	99	68	107	13	68	69	201	132
	1904	18	95	10	5	80	.....	129	6	44	50	141	91
	1899	4	59	6	1	52	.....	74	1	28	36	94	58
Cars and general shop construction and repairs by steam-railroad companies.....	1909	3	1,691	.....	33	1,568	1,305	1,013	42	998	1,020	2,196	1,176
	1904	3	2,109	.....	69	2,040	.....	1,042	81	1,260	1,381	2,745	1,364
	1899	3	1,338	.....	52	1,286	.....	828	67	763	830	1,681	851
Clothing, men's, including shirts.....	1909	3	134	5	11	118	20	84	15	46	37	103	106
	1904	3	82	3	4	75	.....	71	6	25	33	118	85
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Copper, tin, and sheet-iron products.....	1909	21	169	24	7	138	15	142	9	98	118	305	187
	1904	12	128	12	4	112	.....	84	6	72	77	215	138
	1899	9	.....	.....	1	78	.....	53	1	34	60	131	62
Foundry and machine-shop products.....	1909	21	548	15	45	488	1,074	1,227	72	208	782	1,444	662
	1904	13	325	11	24	290	.....	609	34	180	429	878	446
	1899	9	168	7	10	151	.....	353	15	84	225	374	149
Leather goods.....	1909	6	72	5	8	59	41	67	12	30	68	174	106
	1904	5	26	6	.....	20	.....	42	.....	12	35	72	37
	1899	4	.....	.....	1	15	.....	24	1	8	17	39	22
Lumber and timber products.....	1909	12	421	10	42	369	806	880	69	211	575	1,081	506
	1904	11	462	9	34	419	.....	805	39	170	235	622	387
	1899	8	.....	.....	21	337	.....	605	29	166	411	686	275
Oil, cottonseed, and cake.....	1909	4	323	1	53	269	3,801	2,117	81	109	2,850	3,555	699
	1904	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1899	3	.....	.....	25	301	.....	1,019	34	87	1,185	1,546	391
Patent medicines and compounds and druggists' preparations.....	1909	5	22	3	7	12	5	14	8	7	8	38	30
	1904	3	11	8	1	2	.....	4	1	1	5	15	10
	1899	3	.....	.....	5	10	.....	26	7	3	18	49	31
Printing and publishing.....	1909	44	641	45	153	443	713	1,143	292	383	395	1,449	1,084
	1904	33	500	29	66	405	.....	645	73	306	192	881	680
	1899	29	289	36	37	216	.....	307	38	145	95	434	339
All other industries.....	1909	93	1,883	83	335	1,465	6,773	8,683	447	849	7,025	11,557	3,631
	1904	93	1,646	86	194	1,366	.....	5,199	272	702	4,927	7,351	2,424
	1899	59	.....	.....	90	699	.....	2,289	107	312	1,230	2,327	1,088
<b>SAN ANTONIO—All Industries</b> .....	1909	194	3,913	156	652	3,105	6,008	\$8,029	\$753	\$1,760	\$6,962	\$13,435	\$6,483
	1904	141	2,911	110	344	2,457	.....	5,259	406	1,362	3,741	7,402	3,061
	1899	113	.....	.....	190	2,683	.....	3,929	239	1,557	2,951	5,989	3,038
Bread and other bakery products.....	1909	32	213	37	41	135	192	284	19	76	307	565	258
	1904	19	103	10	3	81	.....	86	1	41	179	273	94
	1899	18	83	18	1	64	.....	51	(4)	34	94	174	80
Cars and general shop construction and repairs by steam-railroad companies.....	1909	3	584	.....	27	557	243	245	31	416	253	746	483
	1904	3	836	.....	18	818	.....	308	18	544	261	827	566
	1899	3	1,199	.....	23	1,176	.....	315	21	779	688	1,497	809
Clothing, men's, including shirts.....	1909	5	147	2	13	132	26	65	9	38	96	185	89
	1904	3	42	2	5	35	.....	14	3	6	37	45	8
	1899	3	.....	.....	5	56	.....	14	3	11	42	63	21
Confectionery.....	1909	7	277	8	61	208	86	546	60	60	476	740	264
	1904	3	157	1	25	131	.....	358	34	36	178	313	135
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Copper, tin, and sheet-iron products.....	1909	7	63	7	3	53	15	61	2	39	41	108	67
	1904	5	45	6	5	34	.....	16	3	20	35	76	41
	1899	5	.....	.....	1	40	.....	13	1	30	45	97	52
Foundry and machine-shop products.....	1909	7	248	5	13	230	217	325	24	139	160	399	239
	1904	5	178	1	18	159	.....	315	20	88	75	281	205
	1899	6	242	1	25	216	.....	236	27	111	133	331	198
Ice, manufactured.....	1909	4	65	1	10	54	227	411	11	33	53	168	115
	1904	3	41	.....	13	28	.....	239	12	14	24	77	53
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

1 Figures can not be shown without disclosing individual operations.  
 2 Excluding statistics for one establishment, to avoid disclosure of individual operations.  
 3 Excluding statistics for two establishments, to avoid disclosure of individual operations.  
 4 Less than \$500.

MANUFACTURES—TEXAS.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaries employed.	Wage earners (average number).							
Expressed in thousands.													
<b>SAN ANTONIO—Continued.</b>													
Lumber and timber products.....	1900	7	162	7	17	138	360	\$185	\$15	\$80	\$104	\$237	\$133
	1904	3	38	2	3	33	49	49	3	21	20	53	33
	1899	3	25	5	1	19	15	15	1	12	14	35	21
Marble and stone work.....	1900	5	79	5	10	64	65	45	8	45	20	98	78
	1904	3	41	4	3	34	24	24	4	26	32	74	42
	1899	6	61	7	1	53	58	(1)	27	27	38	113	75
Printing and publishing.....	1900	39	595	29	183	383	328	776	174	210	217	982	765
	1904	35	480	27	100	344	592	592	121	185	169	760	597
	1899	22	334	17	31	286	310	310	30	175	122	402	370
Tobacco manufactures.....	1900	5	102	5	7	90	33	33	4	21	43	102	59
	1904	12	75	12	2	61	21	21	2	15	48	92	44
	1899	5	27	5	2	22	10	10	0	9	12	34	22
All other industries.....	1900	73	1,378	50	267	1,061	5,230	5,653	387	585	5,182	9,115	3,033
	1904	47	875	36	140	600	2,211	3,207	185	306	2,683	4,525	1,842
	1899	42	742	102	102	742	2,808	2,808	141	300	1,763	3,153	1,390
<b>FORT WORTH—All industries.....</b>													
	1900	147	2,641	133	449	2,059	6,614	\$7,443	\$493	\$1,285	\$5,266	\$8,661	\$3,395
	1904	102	1,748	99	220	1,423	3,170	3,170	213	843	3,189	5,668	2,479
	1899	68	1,088	108	108	943	2,163	2,163	131	565	2,147	3,488	1,341
Bread and other bakery products.....	1900	17	140	19	31	90	101	401	23	62	181	314	133
	1904	8	100	9	20	125	361	361	24	45	211	458	217
	1899	6	72	6	1	65	48	48	2	41	109	188	79
Copper, tin, and sheet-iron products.....	1900	7	55	6	5	44	8	60	6	35	71	150	79
	1904	0	46	5	3	38	20	20	2	27	52	108	56
	1899	3	23	2	2	23	14	14	1	15	40	67	27
Foundry and machine-shop products.....	1900	9	94	19	17	58	155	138	24	40	75	175	100
	1904	6	85	6	3	70	72	72	5	44	55	143	88
	1899	4	80	7	4	60	80	80	4	35	30	101	71
Furniture and refrigerators.....	1900	4	121	3	8	110	220	182	6	55	80	215	135
	1904	3	83	2	6	75	91	91	0	37	40	138	89
	1899												
Ice, manufactured.....	1900	6	94	4	15	75	1,615	457	18	60	98	269	171
	1904	4	62	2	9	51	180	180	10	33	28	108	80
	1899	3	57	1	7	40	156	156	11	30	20	81	61
Leather goods.....	1900	6	36	7	9	20	19	61	6	13	57	96	39
	1904	5	97	5	15	77	150	150	13	47	203	357	154
	1899	3	15	3	3	15	20	20	2	11	53	97	44
Lumber and timber products.....	1900	6	118	7	0	102	207	151	10	70	134	253	119
	1904	7	46	10	1	35	46	46	(1)	23	34	78	44
	1899												
Patent medicines and compounds and druggists' preparations.....	1900	6	21	0	0	9	10	37	5	3	21	43	22
	1904	4	11	7	4	4	8	8	2	2	7	20	13
Printing and publishing.....	1900	24	360	23	124	213	346	565	137	175	178	722	544
	1904	19	200	19	73	198	198	198	37	138	166	398	292
	1899	11	129	21	13	95	98	98	14	57	44	159	115
Tobacco manufactures.....	1900	4	21	5	5	16	13	13	7	7	10	26	16
	1904	6	19	6	6	13	14	14	8	8	9	27	18
	1899	3	42	4	4	38	27	27	22	22	18	62	44
All other industries.....	1900	58	1,572	34	225	1,313	3,873	5,288	258	765	4,361	6,308	2,067
	1904	34	849	28	90	731	2,021	2,021	116	439	2,435	3,833	1,398
	1899	35	78	78	78	530	1,602	1,602	97	354	1,833	2,733	900

<sup>1</sup> Less than \$500.  
<sup>2</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.  
<sup>3</sup> Figures can not be shown without disclosing individual operations.

MANUFACTURES—TEXAS.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES.

CITY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manuf-acture.
			Total.	Proprietors and firm members.	Salaried employ-ees.	Wage earners (aver-age number).							
Austin.....	1909	108	1,014	109	151	754	2,211	\$2,340	\$148	\$415	\$1,027	\$2,846	\$1,219
	1904	92	736	65	80	611	.....	1,257	78	349	771	1,569	708
	1899	34	.....	.....	50	405	.....	595	40	243	467	765	308
Beaumont.....	1909	56	1,094	49	182	863	4,500	4,007	214	645	3,444	4,831	1,387
	1904	40	885	38	115	732	.....	2,722	134	426	1,612	2,010	1,008
	1899	30	.....	.....	58	1,005	.....	2,010	84	466	1,007	1,913	816
Brownsville.....	1909	9	70	13	15	51	414	51	13	19	40	121	75
	1904	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleburne.....	1909	24	952	25	102	825	1,499	773	112	533	850	1,577	718
	1904	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Denison.....	1909	29	935	27	75	833	2,306	1,108	70	516	503	1,314	721
	1904	25	813	24	64	725	.....	1,052	64	465	501	1,235	644
	1899	20	.....	.....	52	668	.....	1,108	30	370	370	840	461
El Paso.....	1909	88	2,041	66	223	1,752	3,396	4,252	275	1,093	1,496	3,638	2,142
	1904	54	1,304	42	104	1,158	.....	1,673	128	710	1,131	2,378	1,247
	1899	38	.....	.....	30	716	.....	703	50	402	530	1,213	674
Galveston.....	1909	81	1,390	77	225	1,094	3,633	4,572	295	707	4,287	6,308	2,041
	1904	67	975	60	154	761	.....	2,980	194	470	1,509	2,907	1,308
	1899	100	.....	.....	116	1,422	.....	4,638	147	640	2,025	3,675	1,650
Laredo.....	1909	23	252	28	11	213	353	213	11	87	74	221	147
	1904	18	569	20	34	515	.....	221	30	181	106	454	258
	1899	14	.....	.....	0	372	.....	203	8	162	138	331	193
Marshall.....	1909	22	1,108	18	113	977	1,325	1,690	126	653	803	1,787	984
	1904	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Palestine.....	1909	20	855	26	84	745	1,209	1,524	86	481	622	1,313	691
	1904	17	605	20	41	544	.....	679	45	310	305	735	430
	1899	10	.....	.....	33	481	.....	500	34	245	349	704	355
Paris.....	1909	45	679	33	105	541	2,578	1,381	77	247	862	1,430	568
	1904	29	280	25	45	210	.....	980	45	105	528	855	327
	1899	27	.....	.....	30	263	.....	570	23	97	461	743	282
San Angelo.....	1909	26	180	28	46	115	608	306	28	71	133	318	185
	1904	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sherman.....	1909	36	395	27	95	273	2,150	1,638	98	136	4,047	4,676	629
	1904	39	427	40	74	307	.....	1,586	59	163	2,149	2,641	492
	1899	31	.....	.....	53	314	.....	748	55	130	1,070	1,461	391
Temple.....	1909	37	483	42	75	366	1,616	916	61	215	834	1,346	512
	1904	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tyler.....	1909	23	555	23	48	484	760	661	51	288	530	996	490
	1904	21	417	19	30	368	.....	319	31	192	311	629	318
	1899	10	.....	.....	36	431	.....	321	33	235	352	682	330
Waco.....	1909	92	1,318	79	200	1,033	3,069	3,501	220	588	2,965	4,769	1,804
	1904	76	1,140	78	121	947	.....	2,142	141	440	1,779	2,980	1,261
	1899	80	.....	.....	88	1,004	.....	1,768	94	372	1,320	2,294	968

<sup>1</sup> Figures not available.

<sup>2</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

MANUFACTURES—TEXAS.

TABLE II.—DETAILED STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Pri- mary horse- power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Average number.	Wage earners.			Total.	16 and over.		Under 16.			
					Male.	Female.		Number.		Male.		Female.	Male.	Female.			
								Maximum month.	Minimum month.								
1 All industries.....	4,588	84,575	4,496	3,415	5,808	626	70,230	No 75,048	My 66,079	(1)	(1)	(1)	(1)	(1)	282,471		
2 Artificial stone.....	33	187	40	12	2	133	So 167	Ap 110	162	161	1	1	1	51			
3 Automobiles, including bodies and parts	4	70	2	5	7	56	Oc 63	Ja 47	52	50	1	1	1	22			
4 Boots and shoes, including cut stock and findings.	6	52	10	3	2	36	No 40	Fe 34	40	35	2	3	3	24			
5 Brass and bronze products.....	8	143	6	12	13	112	Mh 132	Au 91	111	111	418	42	7	146			
6 Bread and other bakery products.....	385	2,078	431	42	167	47	1,301	De 1,544	Je 1,325	1,623	1,456	418	42	7	1,281		
7 Brick and tile.....	89	2,135	50	96	49	5	1,935	Jy 2,303	Ja 1,467	2,109	2,058	51	15	7,488			
8 Brooms.....	32	258	56	9	7	2	181	Mh 215	Jy 124	218	191	12	15	110			
9 Butter, cheese, and condensed milk.....	36	143	30	10	11	2	84	De 91	Ja 75	94	93	1	1	477			
10 Canning and preserving.....	19	217	12	18	26	3	158	Jy 258	Ja 91	317	117	177	15	8	243		
11 Carriages and wagons and materials.....	50	522	54	20	35	1	412	Ap 441	Ja 382	398	390	3	5	374			
12 Cars and general shop construction and repairs by steam-railroad companies.	62	10,527	278	444	23	9,782	So 10,142	Au 9,370	9,824	9,810	2	3	7,315				
13 Cars and general shop construction and repairs by street-railroad companies.	14	248	0	8	1	230	De 258	Ja 212	350	350	1	1	529				
14 Cement.....	3	423	10	45	6	362	So 515	Fe 67	452	452	17	20	7,760				
15 Clothing, men's, including shirts.....	25	1,110	16	36	62	13	902	So 1,085	Ja 825	1,141	92	1,012	17	20	459		
16 Confectionery.....	40	907	48	40	137	25	717	No 834	My 627	799	469	354	12	24	607		
17 Cooperage and wooden goods, not elsewhere specified.	11	274	10	10	10	1	243	So 250	My 223	296	259	7	7	346			
18 Copper, tin, and sheet-iron products.....	168	965	180	45	29	8	733	Oc 796	Fe 646	771	752	19	105	211			
19 Cotton goods, including cotton small wares.	13	1,633	24	18	1	1,590	Ja 1,636	No 1,516	1,659	881	543	130	105	4,835			
20 Electroplating.....	4	19	5	3	1	11	Mh 12	Je 11	13	12	1	1	30				
21 Flour-mill and gristmill products.....	238	1,899	225	152	283	23	1,216	Oc 1,313	Ap 1,145	1,355	1,346	3	6	20,765			
22 Food preparations.....	23	367	17	22	41	3	284	De 359	Ja 296	383	274	108	2	1,322			
23 Foundry and machine-shop products.....	143	3,441	134	153	211	18	2,925	Je 3,180	Ja 2,666	2,778	2,755	21	19	5,287			
24 Furniture and refrigerators.....	25	799	20	27	45	6	701	De 804	Au 628	823	786	18	19	1,879			
25 Gas, illuminating and heating.....	27	746	3	56	95	17	675	Jy 704	Fe 494	473	473	1	7	1,990			
26 Ice, manufactured.....	182	1,874	82	200	144	11	1,437	Jy 2,130	Ja 898	1,424	1,416	1	7	20,965			
27 Jewelry.....	13	46	14	1	2	3	26	De 32	Fe 23	32	32	1	1	7			
28 Leather goods.....	67	1,012	68	57	146	20	721	De 766	My 672	778	755	13	10	601			
29 Leather, tanned, curried, and finished.	3	13	4	1	1	8	My 9	Mh 7	9	9	1	1	40				
30 Lime.....	11	386	7	14	10	1	348	Oc 438	Ja 259	354	354	1	1	534			
31 Liquors, malt.....	12	931	6	48	107	5	765	Jy 835	Ja 706	717	716	1	1	7,817			
32 Lumber and timber products.....	790	25,843	985	585	717	38	23,518	De 24,914	Fe 21,661	27,722	27,317	46	359	88,031			
33 Marble and stone work.....	107	881	147	26	102	1	605	Fe 621	Ap 571	633	631	2	1	1,010			
34 Mattresses and spring beds.....	50	334	50	23	25	3	233	Oc 274	Ap 209	280	226	54	3	587			
35 Millinery and lace goods.....	9	92	9	5	3	12	63	So 85	Je 32	51	1	47	3	1			
36 Models and patterns, not including paper patterns.	5	31	4	1	1	25	Je 26	Oc 25	26	26	1	1	62				
37 Oil, cottonseed, and cake.....	194	3,923	30	456	348	7	3,073	No 5,762	Ja 932	0,029	6,022	7	1	45,185			
38 Optical goods.....	4	32	5	8	3	16	So 18	Ja 12	17	15	2	2	15				
39 Paint and varnish.....	6	61	4	8	22	1	26	My 27	De 24	24	22	2	2	82			
40 Patent medicines and compounds and druggists' preparations.	59	382	40	36	135	17	145	Ap 153	De 136	145	97	48	1	51			
41 Photo-engraving.....	4	57	3	9	6	2	37	No 40	Fe 32	39	38	1	1	92			
42 Pottery, terra-cotta, and fire-clay products.	17	475	12	12	29	2	420	Oc 469	Fe 388	440	439	1	1	624			
43 Printing and publishing.....	1,067	7,177	1,150	425	984	201	4,408	De 4,791	Ap 4,274	4,824	3,875	670	254	25	4,392		
44 Rice, cleaning and polishing.....	19	643	22	51	139	1	430	No 621	Jy 115	562	562	1	1	6,274			
45 Salt.....	6	181	3	11	4	1	162	So 181	Ja 142	163	159	11	2	447			
46 Shipbuilding, including boat building.	6	45	8	1	1	36	Fe 46	De 26	43	43	1	1	21				
47 Show cases.....	5	71	5	3	1	62	Au 63	No 59	61	61	1	1	113				
48 Slaughtering and meat packing.....	14	4,248	1	42	527	39	3,639	My 3,856	Ja 3,452	4,039	3,703	258	68	10	11,330		
49 Sugar and molasses.....	6	162	11	6	1	144	No 594	Mh 4	585	581	4	1	3,991				
50 Tobacco manufactures.....	67	428	74	3	11	1	339	De 361	Ja 319	369	226	132	11	7			
51 Turpentine and rosin.....	3	235	2	6	8	219	De 256	Ja 190	256	256	1	1	10				
52 All other industries <sup>a</sup> .....	386	5,750	300	277	570	50	4,463							18,477			

<sup>1</sup> No figures given for reasons explained in the Introduction, page 2. See also discussion of wage earners on page 6.  
<sup>2</sup> Same number reported for one or more other months.  
<sup>3</sup> All other industries embrace—

Agricultural implements.....	4	Clothing, women's.....	2	Flavoring extracts.....	4
Awnings, tents, and sails.....	11	Coffee and spice, roasting and grinding.....	24	Furnishing goods, men's.....	1
Bags, other than paper.....	2	Coffins, burial cases, and undertakers' goods.....	1	Gas and electric fixtures and lamps and reflectors.....	1
Baskets, and rattan and willow ware.....	1	Cordials and syrups.....	3	Glass.....	1
Billiard tables and materials.....	1	Electrical machinery, apparatus, and supplies.....	1	Glass, cutting, staining, and ornamenting.....	3
Blacking and cleansing and polishing preparations.....	1	Engraving and deslaking.....	1	Hair work.....	1
Bluing.....	2	Explosives.....	1	Hand stamps and stencils and brands.....	6
Boxes, cigar.....	1	Fancy articles, not elsewhere specified.....	1	Hats and caps, other than felt, straw, and wool.....	1
Boxes, fancy and paper.....	3	Fertilizers.....	3	Hats, fur-felt.....	1
Carpets, rug.....	2	Files.....	1	Hosiery and knit goods.....	1
Charcoal.....	1	Flags, banners, regatta, society badges and emblems.....	1	House-furnishing goods, not elsewhere specified.....	1
Chemicals.....	2			Iron and steel, blast furnaces.....	1

MANUFACTURES—TEXAS.

THE STATE, BY INDUSTRIES: 1909.

	Capital.	EXPENSES.										Value of products.	Value added by manufacture.
		Total.	Services.			Materials.			Miscellaneous.				
			Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.		
1	\$216,876,579	\$244,872,532	\$5,358,777	\$5,508,778	\$37,907,272	\$7,195,109	\$170,983,406	\$870,010	\$1,738,920	\$1,324,435	\$13,975,910	\$272,895,635	\$94,717,120
2	152,706	183,298	13,544	1,114	70,329	331	85,078	2,500	720	13	8,757	230,391	153,082
3	55,940	187,030	5,100	7,282	39,731	1,110	120,318	5,090	3,107	.....	5,208	183,580	62,152
4	56,247	83,000	5,400	2,344	17,781	737	47,586	1,380	328	.....	7,504	102,133	53,810
5	328,015	438,075	18,000	14,051	61,051	10,638	298,021	0,100	.....	.....	28,795	517,818	208,559
6	4,003,289	4,513,495	50,645	123,400	670,778	93,285	3,968,960	87,082	20,051	535	401,493	5,310,785	2,248,540
7	3,600,752	2,063,023	117,751	40,433	707,419	670,032	89,101	3,503	11,582	8,597	317,645	2,544,702	1,778,009
8	282,766	324,557	7,774	0,637	30,301	2,773	207,257	1,704	852	425	10,834	393,749	183,719
9	309,239	017,482	10,785	1,001	40,190	5,343	524,350	5,078	1,000	.....	20,060	600,432	130,730
10	345,721	338,351	18,210	35,001	44,704	2,747	197,997	2,457	1,508	.....	35,707	498,196	207,452
11	940,529	700,009	36,496	20,829	207,071	12,415	300,768	14,855	5,211	70	30,354	829,725	510,543
12	9,362,207	13,355,343	407,000	309,031	6,714,703	428,502	5,117,028	.....	43,037	3,110	330,703	13,358,948	7,812,518
13	301,540	278,275	8,062	4,761	130,429	2,008	117,718	.....	4,591	.....	9,806	278,274	158,548
14	7,091,289	827,993	44,200	45,700	201,349	242,879	159,704	1,200	10,570	5,630	56,080	854,886	452,243
15	1,556,630	1,000,207	33,688	58,858	311,535	11,124	906,435	15,151	7,309	30,150	110,378	1,788,820	752,201
16	1,402,332	2,142,779	54,002	153,035	218,405	22,877	1,435,933	33,752	0,242	24,473	193,970	2,450,513	901,703
17	446,281	648,583	15,760	9,020	97,986	3,023	484,492	12,825	1,020	1,200	23,257	719,054	231,530
18	1,251,362	1,814,011	59,101	24,522	531,704	9,465	1,071,857	28,470	7,430	3,000	78,402	2,213,934	1,132,012
19	4,282,742	2,505,007	40,810	19,845	500,094	93,834	1,000,402	.....	13,491	5,650	131,321	2,514,781	1,021,285
20	34,400	36,045	2,088	.....	7,996	711	20,779	2,420	66	.....	825	2,000	24,710
21	13,219,157	30,851,015	205,294	300,762	608,772	262,262	28,394,379	5,700	61,021	1,200	884,725	32,484,012	3,827,971
22	1,278,160	4,886,335	37,302	48,438	108,423	37,056	4,541,050	0,872	4,400	.....	101,210	5,229,327	649,712
23	8,240,050	7,005,107	294,496	271,379	1,925,491	207,093	3,661,778	25,244	40,422	0,570	570,923	8,007,911	4,208,470
24	1,704,148	1,310,450	35,900	33,244	330,806	20,837	743,772	6,894	10,222	105	135,550	1,512,380	747,771
25	6,202,454	1,154,599	84,005	53,625	288,307	372,048	172,789	750	70,285	50	112,080	1,644,000	1,009,229
26	3,306,828	2,709,161	238,873	114,702	839,087	797,542	204,301	8,221	72,255	0,358	427,822	3,844,120	2,752,377
27	36,495	58,854	820	1,655	21,395	491	28,751	2,740	218	.....	2,784	85,118	55,870
28	3,268,805	3,940,064	103,566	149,770	463,419	11,032	2,827,872	65,001	20,323	500	303,951	4,347,445	1,508,571
29	22,410	48,790	600	.....	4,784	595	42,354	.....	87	.....	370	55,277	12,388
30	510,935	843,329	17,700	10,380	123,340	79,847	03,473	809	2,283	1,500	37,907	300,035	246,725
31	7,027,038	4,358,906	140,919	566,290	218,167	1,476,754	2,420	.....	071,841	5,523	1,084,893	6,463,472	4,709,051
32	45,552,223	27,634,260	835,590	648,308	11,002,362	134,557	10,869,746	37,877	223,487	010,001	2,371,372	32,201,440	21,107,137
33	963,016	1,118,387	34,533	57,760	425,219	21,574	450,005	0,105	5,210	3,143	84,772	1,445,210	941,631
34	680,115	678,906	26,011	19,984	118,170	8,552	353,161	3,216	3,085	.....	45,827	667,680	295,967
35	47,145	116,434	3,825	5,311	18,372	146	69,338	8,470	400	.....	10,563	133,661	64,177
36	35,180	36,347	1,800	720	22,712	760	8,400	710	215	.....	1,000	44,453	35,203
37	21,506,347	27,180,657	621,893	257,382	1,296,340	671,287	22,767,774	2,675	124,202	8,174	1,430,920	29,915,772	6,470,711
38	85,215	101,804	7,700	5,234	10,980	1,120	64,875	0,000	350	.....	5,533	114,744	48,749
39	114,484	107,109	4,421	5,329	18,018	2,004	60,076	2,635	679	400	12,387	114,418	51,678
40	747,024	807,825	57,415	125,087	62,331	1,027	409,192	15,088	7,735	1,823	187,527	1,013,735	602,916
41	45,607	71,744	9,705	5,780	35,756	2,856	9,802	2,020	111	.....	4,724	86,001	73,853
42	794,914	503,676	28,205	18,109	182,753	136,771	59,021	35	3,333	350	76,000	597,226	402,484
43	9,126,838	9,234,859	669,021	980,607	2,784,633	135,553	2,671,687	235,162	53,813	273,302	1,421,901	11,587,255	8,780,015
44	3,820,027	7,368,582	99,680	124,007	180,022	47,481	7,074,936	4,650	21,930	.....	300,807	8,142,435	1,020,021
45	506,222	338,404	14,447	3,634	81,008	92,582	123,871	1,500	3,544	5,544	11,374	407,100	190,707
46	23,050	65,842	560	.....	29,524	160	34,218	200	25	.....	1,165	75,662	41,284
47	63,683	113,424	3,400	1,200	39,782	1,372	55,056	2,880	432	.....	8,402	121,990	64,062
48	12,438,479	40,949,097	98,780	509,029	1,001,674	388,705	37,020,900	116,752	43,340	.....	780,737	42,529,740	5,119,001
49	3,087,647	788,404	24,740	4,866	77,519	44,741	546,000	.....	9,203	2,800	77,806	868,273	276,863
50	312,508	429,495	1,740	17,708	141,248	386	181,777	7,955	40,152	.....	32,529	508,695	326,532
51	160,674	149,568	9,520	8,160	70,808	50	41,805	.....	525	.....	6,640	217,820	175,071
52	30,950,698	37,189,243	558,200	588,063	2,564,079	1,874,171	29,801,822	70,611	90,271	11,419	1,514,547	42,213,085	10,447,642

\* All other industries embrace—Continued.

Iron and steel, steel works and rolling mills.....	1	Roofing materials.....	2	Surgical appliances and artificial limbs.....	3
Iron and steel, doors and shutters.....	1	Rubber goods, not elsewhere specified.....	2	Type founding and printing materials.....	2
Kaolin and ground earths.....	2	Smelting and refining, copper.....	1	Upholstering materials.....	1
Looking-glass and picture frames.....	1	Smelting and refining, lead.....	1	Vinegar and cider.....	4
Mineral and soda waters.....	212	Soap.....	5	Wall plaster.....	2
Mirrors.....	2	Soda-water apparatus.....	1	Waste.....	3
Mudclage and paste.....	2	Springs, steel, car and carriage.....	1	Window shades and fixtures.....	1
Oil, not elsewhere specified.....	1	Statuary and art goods.....	4	Wirework, including wire rope and cable.....	7
Paper and wood pulp.....	2	Steam packing.....	2	Wood preserving.....	6
Paper goods, not elsewhere specified.....	1	Stereotyping and electrotyping.....	1	Wood, turned and carved.....	5
Peanuts, grading, roasting, cleaning, and shelling.....	4	Stoves and furnaces, including gas and oil stoves.....	1	Woolen, worsted, and felt goods, and wool hats.....	1
Petroleum, refining.....	8	Sugar, refining, not including beet sugar.....	1		

## MANUFACTURES : UTAH

## STATISTICS OF MANUFACTURES FOR THE STATE, CITIES, AND INDUSTRIES

Prepared under the supervision of W. M. STEUART, Chief Statistician for Manufactures

## INTRODUCTION.

This advance bulletin gives the statistics of manufactures for the state of Utah for the calendar year 1909, as shown by the Thirteenth Census. It will be reprinted without change as a part of the Compendium of the Census for Utah, and in the final reports of the Thirteenth Census.

The text summarizes the general results of the census inquiry, presenting a series of special tables in which the main facts printed in the general tables are given in convenient form for the state as a whole and for important industries. It also presents tables in which the statistics for the industries of the state as a whole and for a few important industries are classified by character of ownership, size of establishments, number of wage earners, and prevailing hours of labor, information which could not be presented in general tables for each industry without disclosing the facts for individual establishments.

At the end of the bulletin are two general tables.

Table I gives for 1909, 1904, and 1899 the number of establishments and of persons engaged in the industries, primary power, capital, salaries and wages, cost of materials, value of products, and value added by manufacture, reported for all industries combined and for certain important industries (1) for the state as a whole and (2) for Salt Lake City. It also gives the same items for all industries combined for Ogden, the only city having in 1910 a population of over 10,000 but less than 50,000.

Table II gives statistics in detail for 1909 for the state and for a larger number of industries.

**Scope of census: Factory industries.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of organization, location of establishments, size of establishments, labor force, and similar subjects. When use is made of the data for these purposes it is imperative that due attention should be given to the limitations of the figures. Particularly is this true when the attempt is made to derive from them figures purporting to show average wages, cost of production, or profits. These limitations will be fully discussed in the general report on manufactures for the United States as a whole. It is impossible to reproduce such discussion in the bulletins relative to the individual states.

The census of 1909, like that of 1904, was confined to manufacturing establishments conducted under the factory system, as distinguished from the neighborhood, hand, and building industries. Where statistics for 1899 are given they have been reduced

to a comparable basis by eliminating the latter classes of industries. The census does not include establishments which were idle during the entire year, or had a value of products of less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions, or in governmental establishments, except those of the Federal Government.

**Period covered.**—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—The term "establishment" comprises the factories, mills, or plants which are under a common ownership or control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment, as thus defined, were not all located within the same city or state, separate reports were secured in order that the separate totals might be included in the statistics for each city or state. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products very different from those covered by the class designation, and, on the other hand, may not include the total product covered by this designation, because some part of this product may be made in establishments in which it is not the product of chief value.

**Selected industries.**—The general tables at the end of this bulletin give the principal facts separately for the industries of the state. A selection has been made of the leading industries of the state for more detailed consideration. Sometimes an industry of greater importance than some of those selected is omitted because it comprises so few establishments that these detailed presentations would reveal the operations of individual concerns.

**Comparisons with previous censuses.**—Owing to the changes in industrial conditions it is not always possible to classify establishments by industries in such a way as to permit accurate comparison with preceding censuses. Table I, giving comparable figures for 1909, 1904, and 1899, therefore, does not embrace all the industries shown for 1909 in Table II.

**Influence of increased prices.**—In considering changes in cost of materials, value of products, and value added by manufacture, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures can not be taken as an exact measure of increase in the volume of business.

**Persons engaged in industry.**—At the censuses of 1909, 1904, and 1899, the following general classes of persons engaged in manufacturing industries have been distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks, and (5) wage earners. In the censuses of 1904 and 1899 these five classes were shown according to the three main groups: (1) Proprietors and firm members, (2) salaried officials, clerks, etc., and (3) wage earners. The second group included the three classes of salaried officers of corporations, superintendents and managers, and clerks. In the present census an entirely different

grouping is employed: That into (1) proprietors and officials, (2) clerks, and (3) wage earners. The first group includes proprietors and firm members, salaried officers of corporations, and superintendents and managers.

At this census the number of persons engaged in the industries, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for December 15, or the nearest representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where conditions were exceptional, and particularly in the case of certain seasonal industries, such as canning, the December date could not be accepted as typical, and an earlier date had to be chosen.

In the case of employees other than wage earners the number thus reported on December 15, or other representative day, has been treated as equivalent to the average for the year, since the number of employees of this class does not vary much from month to month in a given industry. In the case of wage earners the average is obtained in the manner explained in the next paragraph.

**Wage earners.**—In addition to the report by sex and age of the number of wage earners on December 15, or other representative day, a report was obtained of the number employed on the 15th of each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because, in view of the variations of date, such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries, as compared with industries in continual operation.

In particular, totals by sex and age for the wage earners reported for the representative day would be misleading, because of the undue weight given to seasonal industries, in some of which, such as canning and preserving, the distribution of the wage earners by sex and age is materially different from that in most industries of more regular operation. In order to determine as nearly as possible the sex and age distribution of the average number of wage earners in the state as a whole, the following procedure has been adopted:

The percentage distribution by sex and age of the wage earners in each industry, for December 15, or the nearest representative day, has been calculated from the actual numbers reported for that date. This percentage has been applied to the average number of wage earners for the year in that industry, to determine the average number of men, women, and children employed. These calculated averages for the several industries have been added up to give the average distribution for the state as a whole.

In 1899 and 1904 the schedule called for the average number of wage earners of each sex 16 years and over, and the total number under 16 years of age, for each month, and these monthly statements were combined in an annual average. Comparatively few manufacturing concerns, however, keep their books in such way as to show readily the number of men, women, and children (under 16) employed each month. These monthly returns by sex and age were, in fact, largely estimates. It was believed that a more accurate and reliable sex and age distribution could be secured by taking as a basis of estimate the actual numbers employed on a single day.

**Prevailing hours of labor.**—The census made no attempt to ascertain the number of employees working a given number of hours

per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and no attention is given to the fact that a limited number of employees may have hours differing from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

**Capital.**—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

**Materials.**—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term materials includes fuel, rent of power and heat, mill supplies, and containers, as well as materials forming a constituent part of the product. Fuel includes all fuel used, whether for heat, light, or power, or for the process of manufacture.

**Expenses.**—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness and allowances for depreciation.

**Value of products.**—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

**Value added by manufacture.**—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishments. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "value added by manufacture."

**Cost of manufacture and profits.**—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products, the rate of profit on the investment could not properly be calculated, because of the very defective character of the returns regarding capital.

**Primary power.**—The figures given for this item show the total of the primary power used by the establishments. They do not

cover the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

**Location of establishments.**—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the fact that often establishments are located just outside the boundaries of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

**Laundries.**—The census of 1909 was the first to include statistics of laundries. The reports are confined to establishments using mechanical power. The data are presented separately and are not included in the general total for manufacturing industries, in order to avoid interference with comparisons with prior censuses.

**Custom gristmills.**—In order to make the statistics for 1909 comparable with those for 1904 the data for these mills have been excluded from all the tables presenting general statistics, and are given in a separate table at the end of this report.

INDUSTRIES IN GENERAL.

**General character of the state.**—Utah, with a gross area of 84,990 square miles, of which 2,806 represent water surface, ranks tenth in size among the states and territories of continental United States. Its population in 1910 was 373,351, as compared with 276,749 in 1900 and 210,779 in 1890. It ranked forty-first among the 49 states and territories as regards population in 1910 and forty-second in 1900. The density of population of the state was 4.5 persons per square mile in 1910, the corresponding figure for 1900 being 3.4.

Salt Lake City, with a population of 92,777, and Ogden, with a population of 25,580, are the only cities in the state having over 10,000 inhabitants. Of the entire population of the state, 46.3 per cent resided in cities and towns having a population of 2,500 inhabitants or over, as against 38.1 per cent in 1900.

Utah is without navigable rivers or lakes. The waters of the numerous mountain streams, however, have been largely utilized in the generation of electrical energy, which is used not only in manufacture

but also in mining and other industries. The diversion of the waters of some of the streams has been directly responsible for the development of several industries, among them the beet-sugar industry, one of the most important of the manufactures in the state.

**Importance and growth of manufactures.**—Although Utah is comparatively unimportant as a manufacturing state, its manufactures have shown marked increases at the last two censuses. In 1849-50, 14 establishments gave employment to 51 wage earners, representing four-tenths of 1 per cent of the total population of the state. In 1909 the percentage of wage earners to the total population of the state was 3.2. During this period the gross value of products per capita of the entire population increased from \$26 to \$166.

The following table gives the most important figures relative to all classes of manufactures combined for 1909, 1904, and 1899, together with percentages of increase from census to census:

	NUMBER OR AMOUNT.			PER CENT OF INCREASE.	
	1909	1904	1899	1904-1909	1899-1904
Number of establishments.....	749	606	575	23.6	5.4
Persons engaged in manufactures.....	14,133	9,650	(1)	46.5	(1)
Proprietors and firm members.....	688	619	(1)	11.1	(1)
Salaried employees.....	1,660	979	599	69.6	63.4
Wage earners (average number).....	11,785	8,052	5,413	46.4	48.8
Primary horsepower.....	42,947	19,397	12,674	121.4	53.0
Capital.....	\$52,627,000	\$26,004,000	\$13,219,000	102.4	96.7
Expenses.....	54,207,000	32,601,000	15,445,000	66.3	111.1
Services.....	10,366,000	6,195,000	3,264,000	67.3	89.8
Salaries.....	1,966,000	1,038,000	501,000	89.4	107.2
Wages.....	8,400,000	5,157,000	2,763,000	62.9	86.6
Materials.....	41,266,000	24,940,000	11,440,000	65.5	118.0
Miscellaneous.....	2,575,000	1,466,000	741,000	75.6	97.8
Value of products.....	61,989,000	38,926,000	17,932,000	59.2	116.5
Value added by manufacture (value of products less cost of materials).....	20,723,000	13,986,000	6,542,000	48.2	113.8

<sup>1</sup> Figures not available.

In 1909 the state of Utah had 749 manufacturing establishments operating under the factory system, which gave employment to an average of 14,133 persons during the year and paid out \$10,366,000 in salaries and wages. Of the persons employed, 11,785 were wage earners. These establishments turned out products to the value of \$61,989,000, to produce which materials costing \$41,266,000 were consumed. The

value added by manufacture was thus \$20,723,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year.

While larger actual increases are shown for the five-year period 1904-1909, the percentages of increase for most of the items are smaller than for the period 1899-1904. During the later period the number of

## STATISTICS OF MANUFACTURES—UTAH.

establishments increased 23.6 per cent and the average number of wage earners 46.4 per cent, while the value of products increased 59.2 per cent and the value added by manufacture 48.2 per cent. As pointed out in the Introduction, it would be improper to infer that manufactures increased in volume to the full extent

indicated by these figures representing values, since the increase shown is certainly due, in part, to the increase that has taken place in the price of commodities.

The relative importance and growth of the leading manufacturing industries of the state are shown in the following table:

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.		PER CENT OF INCREASE. <sup>1</sup>			
		Average number.	Per cent distribution.	Amount.	Per cent distribution.	Amount.	Per cent distribution.	Value of product.		Value added by manufacture.	
								1904-1909	1899-1904	1904-1909	1899-1904
<b>All industries</b> .....	749	11,785	100.0	\$61,989,000	100.0	\$20,723,000	100.0	59.2	116.5	48.2	118.8
Flour-mill and gristmill products.....	60	184	1.0	3,131,000	5.1	620,000	3.0	20.1	46.2	61.0	4.1
Cars and general shop construction and repairs by steam-railroad companies.....	8	1,731	14.7	2,740,000	4.4	1,515,000	7.3	45.2	44.4	42.0	51.0
Printing and publishing.....	122	907	8.2	2,405,000	3.9	1,682,000	8.1	57.0	91.6	40.4	103.4
Butter, cheese, and condensed milk.....	37	214	1.8	1,071,000	3.2	358,000	1.7				
Confectionery.....	17	586	5.0	1,052,000	3.1	661,000	3.2	94.2	149.4	108.5	62.6
Slaughtering and meat packing.....	12	90	0.8	1,600,000	2.7	363,000	1.8	158.8	44.2	161.2	104.4
Liquors, malt.....	5	178	1.5	1,357,000	2.2	1,067,000	5.1	113.0	47.1	131.5	47.8
Bread and other bakery products.....	53	282	2.4	1,214,000	2.0	407,000	2.3	124.0	86.3	78.0	75.2
Canning and preserving.....	24	306	3.4	1,059,000	1.7	343,000	1.7				
Lumber and timber products.....	104	431	3.6	977,000	1.6	542,000	2.6	102.5	-23.9	177.0	-28.6
Foundry and machine-shop products.....	27	373	3.2	922,000	1.5	515,000	2.5				
Brick and tile.....	34	514	4.4	683,000	1.1	547,000	2.6	97.4	86.0	96.8	81.7
Leather goods.....	10	115	1.0	426,000	0.7	167,000	0.8				
Hosiery and knit goods.....	11	174	1.5	419,000	0.7	127,000	0.6	28.5	303.9	-20.1	278.6
Tobacco manufactures.....	28	152	1.3	385,000	0.6	220,000	1.1				
Marble and stone work.....	25	121	1.0	270,000	0.4	179,000	0.9	29.2	140.8	17.6	152.7
Pottery, terra-cotta, and fire-clay products.....	3	96	0.8	195,000	0.3	138,000	0.7	164.7	50.0	171.2	73.7
Salt.....	9	56	0.5	184,000	0.3	131,000	0.6	153.2	105.5	187.5	108.7
All other industries.....	151	5,110	43.4	40,000,000	64.5	11,081,000	53.5	-22.4	70.5	-29.0	73.8

<sup>1</sup> Per cent of increase is based on figures in Table I, and a minus sign (-) denotes decrease.

It should be borne in mind in considering this table that the value of products in some of the industries involves a certain amount of duplication due to the use of the product of one establishment in the industry as material for another establishment.

Three industries, the smelting and refining of copper, the smelting and refining of lead, and the manufacture of beet sugar, greatly predominate in importance, but the data for these can not be shown separately without disclosing individual operations. The most important industries listed in this table, in which they are arranged in the order of the value of products, call for brief consideration.

*Flour-mill and gristmill products.*—This industry ranks fourth in the manufacturing industries of Utah in the value of its products. In 1909 employment was given to 184 wage earners, and products reported valued at \$3,131,000. Owing to the comparatively simple processes involved in this industry and the extent to which these processes are carried on by machinery, the value added by manufacture is not commensurate with the gross value of products.

This classification does not include custom grist-mills, statistics for which are shown separately on page 15.

*Cars and general shop construction and repairs by steam-railroad companies.*—This class of manufacture represents the work done in car shops of steam-railroad companies, and is practically confined to repairs to the rolling stock and equipment. The statistics do not include minor repairs made in roundhouses. This industry gave employment to a greater number of wage earners than any other in the state, an average of 1,731, and reported products valued at \$2,740,000.

*Printing and publishing.*—Those establishments engaged in bookbinding and blank-book making; engraving, steel and copper plate, including plate printing; lithographing; book and job printing; and the printing and publishing of newspapers and periodicals are included in this industry. An average of 967 wage earners were employed in 1909, and a value of products was reported amounting to \$2,405,000.

*Butter, cheese, and condensed milk.*—The 37 establishments reported for this industry may be classified according to their chief product, as follows: Butter, 26; cheese, 9; and condensed milk, 2. Notwithstanding a decrease of 13 in the total number of establishments from 1904 to 1909, there was a great increase in the value of products for the industry, but the exact proportions are not given, because for 1904 it was

found necessary to omit figures for one establishment in order not to disclose its operations.

*Confectionery.*—This industry shows an increase in all important items. From 1904 to 1909 there was an increase of 251, or 74.9 per cent, in average number of wage earners; of \$947,000, or 94.2 per cent, in value of products; and of \$344,000, or 108.5 per cent, in value added by manufacture.

*Slaughtering and meat packing.*—From 1904 to 1909 this industry shows an increase of 9 in number of establishments, compared with a decrease of 5 from 1899 to 1904. During the later period there were increases of 68, or 219.4 per cent, in the average number of wage earners, and of \$1,037,000, or 158.8 per cent, in value of products.

There are 13 other important industries each of which had a value of products in 1909 in excess of \$100,000, included with all other industries in some cases, because the operations of individual establishments would be disclosed if they were shown separately, in others, the returns do not properly present the true condition of the industry, which is more or less interwoven with one or more other industries, and in still other cases, because comparable statistics for the different census years are not available. These 13 industries are: Awnings, tents, and sails; boots and shoes, including cut stock and findings; cars and general shop construction and repairs by street-railroad companies; cement; clothing, men's, including shirts; coffee and spice, roasting and grinding; coke; copper, tin, and sheet-iron products; furniture and refrigerators; gas, illuminating and heating; lime; mattresses and spring beds; and mineral and soda waters. The statistics, however, for the manufacture of men's clothing, furniture, gas, lime, and mattresses and spring beds are presented in Table II for 1909.

When measured by value added by manufacture rather than by value of products, considerable change occurs in the relative order of the industries shown separately. The railroad car shops continue to rank second. Printing and publishing advances to first place, and the malt-liquor industry to third place, while the flour-mill and gristmill industry drops from first to fifth place.

In value of products the lumber and timber industry showed a greater rate of increase from 1904 to 1909 than any other of the industries shown separately, namely, 192.5 per cent. The marble and stone work, the pottery, and the slaughtering and meat-packing industries showed marked increases both in gross value of products and in value added by manufacture. The lumber industry was the only one which showed a decrease in value of products

from 1899 to 1904, while the salt industry was the only one which showed a decrease from 1904 to 1909. The lumber industry showed a decrease in the value added by manufacture from 1899 to 1904, while the salt and the hosiery and knit-goods industries showed decreases in this item from 1904 to 1909.

*Persons engaged in manufacturing industries.*—The following table shows for 1909 the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables is an estimate obtained by the method described in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes.....	14,133	12,680	1,453
Proprietors and officials.....	1,221	1,195	26
Proprietors and firm members.....	688	673	15
Salaried officers of corporations.....	135	132	3
Superintendents and managers.....	398	390	8
Clerks.....	1,127	923	204
Wage earners (average number).....	11,785	10,502	1,223
16 years of age and over.....	11,075	10,470	1,205
Under 16 years of age.....	110	92	18

The average number of persons engaged in manufactures during 1909 was 14,133, of whom 11,785 were wage earners. Of the remainder, 1,221 were proprietors and officials, and 1,127 were clerks. Corresponding figures for individual industries will be found in Table II.

The following table shows for 1909 the percentage of proprietors and officials, clerks, and wage earners, respectively, among the total number of persons employed in manufactures. It covers all industries combined and 9 important industries individually:

INDUSTRY.	PERSONS ENGAGED IN MANUFACTURES.			
	Total number.	Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
All industries.....	14,133	8.6	8.0	83.4
Bread and other bakery products.....	412	24.3	7.3	68.4
Butter, cheese, and condensed milk.....	285	15.4	9.5	75.1
Canning and preserving.....	401	8.5	5.0	85.9
Cars and general shop construction and repairs by steam-railroad companies.....	1,700	0.6	2.7	96.7
Confectionery.....	745	4.6	16.8	78.7
Flour-mill and gristmill products.....	282	28.0	6.7	65.2
Foundry and machine-shop products.....	428	9.3	3.5	87.1
Lumber and timber products.....	629	28.1	3.3	68.5
Printing and publishing.....	1,475	11.5	23.0	65.6
All other industries.....	7,026	6.9	6.3	86.8

## STATISTICS OF MANUFACTURES—UTAH.

Of the total number of persons engaged in all manufacturing industries, 8.6 per cent were proprietors and officials, 8 per cent clerks, and 83.4 per cent wage earners. In the bakery, the lumber and timber, and the flour and grist mill industries many of the establishments are small and the work is to a large extent done by the proprietors or their immediate representatives, so that the proportion of persons engaged in these three industries falling in the class of proprietors and officials is very much higher than for most other industries or for all industries combined. The smallest proportion of proprietors and officials is shown for the steam-railroad repair shops and is due partly to the fact that the establishments in this industry were under corporate ownership, and so reported no proprietors; and partly to the fact that the higher officials of the railroad companies who exercise general supervision over them are not as a rule assigned to the supervision of this particular branch of the work.

The following table shows, for 1909, in percentages, for all industries combined, the distribution of the average number of wage earners, by age periods and for those 16 years of age and over by sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries separately, a similar distribution of wage earners as reported for December 15, or the nearest representative day. As a means of judging the importance of the several industries the average total number employed for the year is also given in each case.

INDUSTRY.	WAGE EARNERS.			
	Average number. <sup>1</sup>	Per cent of total.		
		16 years of age and over.		Under 16 years of age.
Male.	Female.			
<b>All industries.....</b>	<b>11,785</b>	<b>88.8</b>	<b>10.2</b>	<b>0.9</b>
Bread and other bakery products.....	282	81.0	17.4	0.7
Butter, cheese, and condensed milk.....	214	84.6	15.4	
Canning and preserving.....	306	89.1	55.3	5.6
Cars and general shop construction and repairs by steam-railroad companies.....	1,731	100.0		
Confectionery.....	586	30.2	60.1	0.7
Flour-mill and gristmill products.....	184	100.0		
Foundry and machine-shop products.....	373	100.0		
Lumber and timber products.....	431	98.6	0.9	0.5
Printing and publishing.....	667	84.4	13.3	2.3
All other industries.....	6,621	93.6	5.5	0.9

<sup>1</sup> For method of estimating the distribution, by sex and age periods, of the average number in all industries combined, see Introduction.

For all industries combined, 88.8 per cent of the average number of wage earners were males 16 years of age and over; 10.2 per cent females 16 years of age and over; and only nine-tenths of 1 per cent persons

under the age of 16. In all industries combined only 1,205 women and 110 children were employed as wage earners. More than two-thirds of the wage earners employed in the manufacture of confectionery and over one-half of those engaged in canning and preserving were females 16 years of age and over. The largest proportions of children employed, 5.6 per cent and 2.3 per cent, were reported from the canning and preserving, and the printing and publishing industries, respectively.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904 it is necessary to use the classification employed at the earlier census. (See Introduction.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				
	1909		1904		Per cent of increase, 1904-1909.
	Number.	Per cent distribution.	Number.	Per cent distribution.	
<b>Total.....</b>	<b>14,133</b>	<b>100.0</b>	<b>9,650</b>	<b>100.0</b>	<b>46.5</b>
Proprietors and firm members.....	688	4.9	619	6.4	11.1
Salaried employees.....	1,660	11.7	979	10.1	66.6
Wage earners (average number)....	11,785	83.4	8,052	83.4	46.4

Comparable figures are not obtainable for 1899. The table shows a greater percentage of increase in the salaried employees than in the other two classes.

The following table shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over according to sex, for 1909, 1904, and 1899. The averages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
<b>Total.....</b>	<b>11,785</b>	<b>100.0</b>	<b>8,052</b>	<b>100.0</b>	<b>5,413</b>	<b>100.0</b>
16 years of age and over..	11,075	99.1	7,857	97.6	5,240	96.8
Male.....	10,470	88.8	6,840	84.9	4,063	86.1
Female.....	1,205	10.2	1,017	12.6	577	10.7
Under 16 years of age....	110	0.9	195	2.4	173	3.2

This table indicates that for all industries combined there have been actual and relative decreases during the 10 years in the employment of children under 16

years of age. While the actual number of adult females has more than doubled during the decade, little change is shown in 1909, as compared with 1899, in the proportion of male and female wage earners. In 1909 males 16 years of age and over formed 88.8 per cent of all wage earners, as compared with 86.1 per cent in 1899. The year 1904 showed the highest proportion of women employed, with a corresponding reduction in the proportion of men.

**Wage earners employed by months.**—The following table gives the number of wage earners employed on the 15th of each month during the year 1909, for all industries combined, for the canning and preserving industry separately, and for all other industries combined. It gives also the percentage which the number reported for each month is of the greatest number reported for any month. In Table II, page 18, is shown for practically all of the important industries in the state, the largest number and also the smallest number of wage earners reported for any month. The figures are for the 15th day, or the nearest representative day, of the month.

The beet-sugar and the canning and preserving industries are the most seasonal in character in the state. The beet-sugar industry showed the greatest activity in October, November, and December, while employment in the canning and preserving industry reached the maximum in September. In the latter industry the number of wage earners increased from 69 in February to 1,256 in September. The time of greatest activity in each of the above-named industries is dependent upon the time of ripening of the raw materials. While the smelting and refining of lead is not

a seasonal industry, and like the beet-sugar industry the figures can not be presented separately, there was a considerable fluctuation in the number of wage earners employed. For all other industries combined, the largest number of wage earners was employed in November, but the difference between the number in this month and in that of February, the month of least activity, was only 14.3 per cent.

MONTH.	NUMBER OF WAGE EARNERS.					
	All industries.		Canning and preserving.		All other industries.	
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January.....	11,412	86.0	72	5.7	11,340	93.6
February.....	10,440	78.7	69	5.5	10,380	85.7
March.....	10,504	79.8	70	6.3	10,515	86.8
April.....	10,830	81.6	120	10.0	10,704	88.4
May.....	10,740	81.0	170	13.5	10,570	87.3
June.....	11,868	89.4	305	24.3	11,563	95.5
July.....	12,430	93.7	538	42.8	11,898	98.2
August.....	12,234	92.1	631	50.2	11,603	95.8
September.....	13,277	100.0	1,256	100.0	12,021	90.2
October.....	13,070	98.4	1,020	81.2	12,050	90.5
November.....	12,495	93.7	333	26.5	12,112	100.0
December.....	12,053	90.8	153	12.2	11,900	98.2

**Prevailing hours of labor.**—In the following table wage earners have been classified according to the hours of labor prevailing in the establishments in which they are employed. In making this classification the average number of wage earners employed during the year is used, and the number employed in each establishment is classified as a total according to the hours prevailing in that establishment, even though a few employees work a greater or less number of hours.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries.....	11,785	2,093	374	2,079	3,545	1,183	1,216	406	397
Bread and other bakery products.....	282	2		9	61	178	28	2	2
Brick and tile.....	514	253		91	9	161			
Butter, cheese, and condensed milk.....	214	79		6	7	13	109		
Canning and preserving.....	300	85		77	33	102		0	
Cars and general shop construction and repairs by steam-railroad companies.....	1,731			1,027			704		
Confectionery.....	586	67	70	123	37	285	3		1
Flour-mill and gristmill products.....	184	12		8	5	101	39	18	1
Foundry and machine-shop products.....	373	46	21	285	33	4	4		
Hosiery and knit goods.....	174	38	72	64					
Leather goods.....	115	5	32	31	30	8			
Liquors, malt.....	178	141	37			75			
Lumber and timber products.....	431	105	85	97			9		
Marble and stone work.....	121	59	5	30	21				
Pottery, terra-cotta, and fire-clay products.....	96		28		1		72		
Printing and publishing.....	907	488	253	69	108	7	2		
Salt.....	56	48				6		2	
Slaughtering and meat packing.....	99	6		2	32	59			
Tobacco manufactures.....	152	150		1		1			
All other industries.....	5,116	409	270	165	3,099	92	246	375	393

It is evident from these figures that for more than one-half of the wage earners employed in the manufacturing industries of Utah the prevailing hours of labor range from 54 to 60 a week, although 25.2 per cent of the total number of wage earners were employed in establishments where less than 54 hours a week prevailed, and 17.1 per cent were employed in establishments where more than 60 hours a week prevailed.

The large number of wage earners shown for the group working between 54 and 60 hours a week is due to the fact that these are the prevailing hours in the lead and copper smelters and refineries. The wage earners employed in the steam-railroad repair shops and in the foundries and machine shops form a large part of those in the group working 54 hours a week. Relatively long hours are what might be expected in seasonal industries where the operations for the entire year are largely confined to a few weeks; consequently, in the canneries, the prevailing hours are mainly 60 per week. The bakery, confectionery, and flour-mill and grist-mill industries are also largely on a 60-hour-a-week basis, but the brick and tile, malt liquor, printing and publishing, tobacco manufactures, and lumber and timber industries report 48 hours or less per week for many of the wage earners.

**Location of establishments.**—The next table shows the extent to which the manufactures of Utah are centralized in the two cities of Salt Lake and Ogden. (See Introduction.)

ITEM.	Year.	Total.	LOCATION OF ESTABLISHMENTS.		PER CENT OF TOTAL.	
			In cities with population of 10,000 and over.	Outside districts.	In cities with population of 10,000 and over.	Outside districts.
Population.....	1910 1900	373,351 270,749	118,357 69,844	254,994 206,905	31.7 25.2	68.3 74.8
Number of establishments.	1909 1904 1899	749 606 575	313 255 205	436 351 370	41.8 42.1 35.7	58.2 57.9 64.3
Average number of wage earners.	1909 1904 1899	11,785 8,052 5,413	5,610 3,789 2,832	6,175 4,263 2,581	47.6 47.1 52.3	52.4 52.9 47.7
Value of products....	1909 1904 1899	\$61,930,277 38,920,404 17,981,048	\$17,064,204 10,051,040 5,521,140	\$44,025,073 28,875,424 12,460,508	27.5 25.8 30.7	72.5 74.2 69.3
Value added by manufacture.	1909 1904 1899	20,723,610 13,986,037 6,541,398	8,383,756 5,138,047 2,865,094	12,339,860 8,848,590 3,676,304	40.5 36.7 43.8	59.5 63.3 56.2

In 1909, 27.5 per cent of the total value of products was reported from the two cities having over 10,000 inhabitants, and 47.6 per cent of the average number of wage earners were employed there. The percentages indicate that relatively no great change took place during the last 5 or 10 years. In 1899 the percentage of city production was greater than in 1909 or in 1904. In all three census years the city group comprised the same two cities.

In respect to population, the cities covered by the table increased 69.5 per cent from 1900 to 1910, while in the remainder of the state the increase was only 23.2 per cent. From 1899 to 1909 the number of establishments located in these cities increased 52.7 per cent, while those located in the outside districts increased only 17.8 per cent. In respect to the average number of wage earners, however, the outside districts show a greater percentage of increase than the cities, the percentage of increase from 1899 to 1909 in the former being 139.2 per cent and in the latter 98.1 per cent. The relative increase in the value of products during the decade was also greater for the industries located outside these two cities, the figures being 260.5 per cent and 209.1 per cent, respectively. This greater increase in average number of wage earners and value of products outside of the cities is due to the fact that three of the most important industries of Utah, namely, the manufacture of beet sugar and the smelting and refining of copper and of lead, are conducted in establishments all of which are located beyond the corporate limits of Salt Lake City and Ogden.

The following table shows the average number of wage earners and the value of products for Salt Lake City and Ogden separately for 1909, 1904, and 1899:

CITY.	AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.		
	1909	1904	1899	1909	1904	1899
Salt Lake City.....	4,287	2,776	2,154	\$13,351,247	\$7,543,983	\$4,278,926
Ogden.....	1,323	1,013	678	3,712,057	2,507,057	1,242,214

<sup>1</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

Both cities show decided increases in average number of wage earners and value of products for the two five-year periods. The leading industries in Salt Lake City in 1909 were printing and publishing, the steam-railroad repair shops, the manufacture of confectionery, the breweries, bakeries, and foundries and machine shops. When measured by value of products, the largest industry in Salt Lake City was printing and publishing, the establishments located in this city being credited with 82.5 per cent of the total value of products for this industry in the state, and showing an increase over 1904 of \$747,000, or 60.4 per cent. Steam-railroad repair shops was the industry of chief importance when viewed from the standpoint of the employment of labor, but statistics for this industry, as well as for the malt-liquor industry, are not shown separately in Table I, in order to avoid the disclosure of individual operations. Of the industries shown separately in Table I, the lumber and timber industry showed the largest percentage of increase from 1904 to 1909, both in the value of products and in the value added by manufacture, being 184.8 per cent and 152.4 per cent, respectively.

The city of Ogden reported a diversity of manufacturing activities. Chief among the industries are the steam-railroad repair shops, slaughtering and meat-packing establishments, creameries, confectioneries, canning and preserving establishments, flour mills and grist mills, and malt-liquor establishments.

Character of ownership.—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available. Figures for 1909 only are presented for several important industries individually. In order to avoid disclosing the operations of individual concerns it is necessary to omit several important industries from this and the table following:

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>				
1909.....	749	11,785	\$61,989,277	\$20,723,616
1904.....	806	8,052	38,926,464	13,986,637
Individual:				
1909.....	298	986	3,194,702	1,665,833
1904.....	257	764	2,002,858	1,016,139
Firm:				
1909.....	137	537	1,743,262	795,086
1904.....	135	634	1,844,084	825,197
Corporation:				
1909.....	294	9,998	56,234,329	17,912,119
1904.....	293	6,544	34,765,530	11,914,633
Other:				
1909.....	20	264	816,984	349,678
1904.....	11	110	313,992	230,668
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
Individual:				
1909.....	39.8	8.4	5.2	8.0
1904.....	42.4	9.5	5.1	7.3
Firm:				
1909.....	18.3	4.6	2.8	3.8
1904.....	22.3	7.9	4.7	5.9
Corporation:				
1909.....	39.3	84.8	90.7	86.4
1904.....	33.5	81.3	80.3	85.2
Other:				
1909.....	2.7	2.2	1.3	1.7
1904.....	1.8	1.4	0.8	1.6
<b>Bread and other bakery products, 1909</b>	53	282	\$1,214,135	\$466,944
Individual.....	39	79	405,857	142,032
Firm.....	6	58	250,270	83,235
Corporation <sup>1</sup> .....	8	145	558,009	241,677
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	73.6	28.0	33.4	30.4
Firm.....	11.3	20.6	20.6	17.8
Corporation.....	15.1	51.4	46.0	51.8
<b>Butter, cheese, and condensed milk, 1909</b>	37	214	\$1,971,031	\$358,079
Individual.....	9	8	100,973	17,898
Firm.....	5	7	106,388	23,617
Corporation.....	15	148	1,333,033	234,402
Other.....	8	51	430,799	82,262
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	24.3	3.7	4.0	5.0
Firm.....	13.5	3.3	5.4	6.6
Corporation.....	40.5	69.2	67.7	65.5
Other.....	21.6	23.8	22.3	23.0
<b>Flour-mill and gristmill products, 1909</b>	60	184	\$3,130,895	\$620,285
Individual.....	8	15	244,681	39,751
Firm.....	12	18	270,225	60,695
Corporation.....	40	151	2,615,989	520,819
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	13.3	8.2	7.8	6.4
Firm.....	20.0	9.8	8.6	9.6
Corporation.....	66.7	82.1	83.6	84.0

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>Foundry and machine-shop products, 1909</b>				
Individual.....	27	373	\$922,125	\$515,370
Firm.....	13	101	263,740	145,699
Corporation.....	3	30	71,054	41,615
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	48.1	27.1	28.6	28.3
Firm.....	11.1	8.0	7.8	8.1
Corporation.....	40.7	64.0	63.6	63.7
<b>Lumber and timber products, 1909</b>				
Individual.....	104	431	\$976,589	\$541,682
Firm.....	41	195	298,999	127,731
Corporation.....	34	71	109,434	70,844
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	39.4	24.4	21.4	23.0
Firm.....	32.7	16.5	11.2	14.2
Corporation.....	27.9	59.2	67.4	62.2
<b>Printing and publishing, 1909</b>				
Individual.....	122	967	\$2,404,602	\$1,681,341
Firm.....	51	171	364,686	280,492
Corporation.....	7	77	160,855	114,104
Other.....	45	520	1,520,836	1,025,807
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	42.0	17.7	15.2	10.7
Firm.....	13.9	8.0	7.1	6.8
Corporation.....	36.0	63.8	63.2	61.0
Other.....	6.6	20.6	14.5	15.5

<sup>1</sup> Includes the group "Other," to avoid disclosure of individual operations.

The most important distinction shown is that between corporate and all other forms of ownership. For all industries combined, 39.3 per cent of the total number of establishments were in 1909 under corporate ownership, as against 60.8 per cent under all other forms. The corresponding figures for 1904 were 33.5 per cent and 66.5 per cent, respectively. In respect to value of products the corresponding proportions are reversed. In 1909 the establishments operated by corporations reported 90.7 per cent of the total value, as against 9.3 per cent for those under all other forms of ownership, while in 1904 the corresponding figures were 89.3 per cent and 10.6 per cent, respectively. The greatest relative decrease from 1904 to 1909 is shown for establishments operated by firms, which represented only 18.3 per cent of the total number of establishments and produced but 2.8 per cent of the total value of products in 1909, as compared with 22.3 per cent and 4.7 per cent, respectively, in 1904.

Size of establishment.—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it the following table groups the establishments according to the value of their products. The table also shows the average size of establishments for all industries combined and for important industries separately as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the

last two censuses; while for certain important industries figures are given for 1909 only.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>				
1909.....	749	11,785	\$61,989,277	\$20,723,816
1904.....	606	8,052	38,926,464	13,666,637
<b>Less than \$5,000:</b>				
1909.....	282	399	704,998	470,371
1904.....	231	302	485,115	314,800
<b>\$5,000 and less than \$20,000:</b>				
1909.....	220	870	2,270,058	1,210,958
1904.....	201	835	2,213,115	1,188,471
<b>\$20,000 and less than \$100,000:</b>				
1909.....	176	2,244	7,716,935	3,251,752
1904.....	120	1,664	5,562,721	2,351,559
<b>\$100,000 and less than \$1,000,000:</b>				
1909.....	64	5,081	18,197,110	8,197,586
1904.....	40	3,103	9,687,447	4,201,505
<b>\$1,000,000 and over:</b>				
1909.....	7	3,191	33,100,170	7,574,049
1904.....	5	1,988	20,978,000	5,870,293
<b>Per cent of total:</b>				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
<b>Less than \$5,000:</b>				
1909.....	37.6	3.4	1.1	2.3
1904.....	38.1	3.8	1.2	2.2
<b>\$5,000 and less than \$20,000:</b>				
1909.....	29.4	7.4	3.7	5.9
1904.....	33.2	11.6	5.7	8.5
<b>\$20,000 and less than \$100,000:</b>				
1909.....	23.5	19.0	12.4	15.7
1904.....	21.3	20.7	14.3	16.8
<b>\$100,000 and less than \$1,000,000:</b>				
1909.....	8.5	43.1	29.4	39.6
1904.....	6.6	39.3	24.9	30.5
<b>\$1,000,000 and over:</b>				
1909.....	0.9	27.1	53.4	36.6
1904.....	0.8	24.7	53.9	42.0
<b>Average per establishment:</b>				
1909.....		16	\$82,763	\$27,668
1904.....		13	64,235	23,080
<b>Bread and other bakery products, 1909.....</b>	53	282	\$1,214,185	\$406,944
Less than \$5,000.....	21	7	54,833	23,651
\$5,000 and less than \$20,000.....	18	42	180,467	70,995
\$20,000 and less than \$100,000.....	11	101	436,822	152,783
\$100,000 and less than \$1,000,000.....	3	132	542,063	219,515
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
Less than \$5,000.....	39.6	2.5	4.5	5.1
\$5,000 and less than \$20,000.....	34.0	14.9	14.9	16.2
\$20,000 and less than \$100,000.....	20.8	35.8	36.0	32.7
\$100,000 and less than \$1,000,000.....	5.7	46.8	44.0	47.0
<b>Average per establishment.....</b>		5	\$22,909	\$8,810
<b>Butter, cheese, and condensed milk, 1909.....</b>	37	214	\$1,971,031	\$358,079
Less than \$5,000.....	4	3	12,539	3,348
\$5,000 and less than \$20,000.....	17	23	194,065	37,011
\$20,000 and less than \$100,000.....	12	43	461,205	83,783
\$100,000 and less than \$1,000,000.....	4	145	1,302,082	233,937
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
Less than \$5,000.....	10.8	1.4	0.6	0.9
\$5,000 and less than \$20,000.....	45.0	10.7	9.9	10.3
\$20,000 and less than \$100,000.....	32.4	20.1	23.4	23.4
\$100,000 and less than \$1,000,000.....	10.8	67.8	66.1	65.3
<b>Average per establishment.....</b>		6	\$53,271	\$9,678
<b>Flour-mill and gristmill products, 1909.....</b>	60	184	\$3,130,895	\$620,265
Less than \$5,000.....	3	1	9,224	3,774
\$5,000 and less than \$20,000.....	12	12	173,810	24,507
\$20,000 and less than \$100,000.....	38	113	1,793,751	385,092
\$100,000 and less than \$1,000,000.....	7	58	1,154,104	206,892
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
Less than \$5,000.....	5.0	0.5	0.3	0.6
\$5,000 and less than \$20,000.....	20.0	6.5	5.6	4.0
\$20,000 and less than \$100,000.....	63.3	61.4	57.3	62.1
\$100,000 and less than \$1,000,000.....	11.7	31.5	36.9	33.3
<b>Average per establishment.....</b>		3	\$52,182	\$10,338
<b>Foundry and machine-shop products, 1909.....</b>	27	373	\$922,125	\$515,370
Less than \$5,000.....	5	10	15,501	11,928
\$5,000 and less than \$20,000.....	10	53	107,400	57,134
\$20,000 and less than \$100,000.....	8	137	325,505	227,983
\$100,000 and less than \$1,000,000.....	4	173	478,560	218,325
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
Less than \$5,000.....	18.5	2.7	1.7	2.3
\$5,000 and less than \$20,000.....	37.0	14.2	11.7	11.1
\$20,000 and less than \$100,000.....	29.6	36.7	35.3	44.2
\$100,000 and less than \$1,000,000.....	14.8	46.4	51.4	42.4
<b>Average per establishment.....</b>		14	\$34,153	\$19,088

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>Lumber and timber products, 1909.....</b>	104	431	\$976,589	\$541,662
Less than \$5,000.....	70	112	140,068	111,433
\$5,000 and less than \$20,000.....	20	93	181,339	121,155
\$20,000 and less than \$100,000.....	14	220	648,564	309,094
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
Less than \$5,000.....	67.3	26.0	15.0	20.6
\$5,000 and less than \$20,000.....	19.2	21.6	18.6	22.4
\$20,000 and less than \$100,000.....	13.5	52.4	66.4	57.1
<b>Average per establishment.....</b>		4	\$9,300	\$5,268
<b>Printing and publishing, 1909.....</b>	123	967	\$2,404,602	\$1,681,341
Less than \$5,000.....	62	95	150,828	120,244
\$5,000 and less than \$20,000.....	42	102	451,247	344,980
\$20,000 and less than \$100,000.....	13	253	680,006	484,018
\$100,000 and less than \$1,000,000.....	5	427	1,122,521	732,101
<b>Per cent of total.....</b>	100.0	100.0	100.0	100.0
Less than \$5,000.....	50.8	9.8	6.3	7.2
\$5,000 and less than \$20,000.....	34.4	19.9	18.8	20.5
\$20,000 and less than \$100,000.....	10.7	26.2	28.3	28.8
\$100,000 and less than \$1,000,000.....	4.1	44.2	46.7	43.5
<b>Average per establishment.....</b>		8	\$19,710	\$13,731

\* Includes the group "\$100,000 and less than \$1,000,000."

The table shows that, in 1909, of the 749 establishments only 7, or nine-tenths of 1 per cent, had a value of product exceeding \$1,000,000. These establishments, however, had an average number of wage earners of 3,191, or 27.1 per cent of the total number in all establishments, and reported 53.4 per cent of the total value of products and 36.6 per cent of the total value added by manufacture.

On the other hand, the very small establishments—that is, those having a value of products of less than \$5,000—constituted a considerable proportion (37.6 per cent) of the total number of establishments, but the value of their products amounted to only 1.1 per cent of the total. The great bulk of the manufacturing, as measured by value of products and value added by manufacture, was reported by establishments having products valued at not less than \$100,000.

The fact that the average value of products per establishment increased from \$64,235 in 1904 to \$82,763 in 1909, and the value added by manufacture from \$23,080 to \$27,668, does not necessarily indicate a tendency toward concentration. The increased values shown are probably due in part to the increase that has taken place in the prices of commodities, but they are also largely due to the fact that there have been established in the state during the intercensal period a large copper smelter and a large beet-sugar factory. The average number of wage earners per establishment increased from 13 to 16.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The next table shows for 1909 such a classification for all

industries combined and for 9 important industries individually, and gives not only the number of estab-

lishments falling in each group, but also the average number of wage earners employed.

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All industries.....	749	72	445	139	58	13	16	2	4	1
Bread and other bakery products.....	53	13	27	9	3	1				
Butter, cheese, and condensed milk.....	37	5	27	2	2	1				
Canning and preserving.....	24		5	13	6					
Cars and general shop construction and repairs by steam-railroad companies.....	8		2	1		1	1	1	2	
Confectionery.....	17		8	2	3	2	2			
Flour-mill and gristmill products.....	60	5	49	6						
Foundry and machine-shop products.....	27		14	6	6	1				
Lumber and timber products.....	104	8	76	18	3					
Printing and publishing.....	122	25	65	23	6	1	2			
All other industries.....	207	16	173	59	20	6	10	1	2	1
AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	11,785		1,007	1,471	1,940	885	3,314	650	3,408	1,104
Bread and other bakery products.....	282		52	70	93	61				
Butter, cheese, and condensed milk.....	214		58	10	85	55				
Canning and preserving.....	306		18	144	234					
Cars and general shop construction and repairs by steam-railroad companies.....	1,731		6	18		78	111	287	1,281	
Confectionery.....	580		16	38	96	166	270			
Flour-mill and gristmill products.....	194		125	50						
Foundry and machine-shop products.....	373		47	60	204	56				
Lumber and timber products.....	431		140	205	80					
Printing and publishing.....	967		164	217	218	68	300			
All other industries.....	6,021		375	632	930	401	1,633	300	1,177	1,104
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	100.0		8.5	12.5	16.5	7.5	19.6	5.6	29.4	9.4
Bread and other bakery products.....	100.0		18.4	27.0	33.0	21.6				
Butter, cheese, and condensed milk.....	100.0		27.1	7.5	30.7	25.7				
Canning and preserving.....	100.0		4.5	36.4	50.1					
Cars and general shop construction and repairs by steam-railroad companies.....	100.0		0.3	1.0		4.5	6.4	16.6	71.1	
Confectionery.....	100.0		2.7	6.5	16.4	28.3	46.1			
Flour-mill and gristmill products.....	100.0		67.0	32.1						
Foundry and machine-shop products.....	100.0		12.6	17.7	54.7	15.0				
Lumber and timber products.....	100.0		33.9	47.0	18.0					
Printing and publishing.....	100.0		17.0	22.4	22.5	7.0	31.0			
All other industries.....	100.0		5.7	9.5	14.0	6.0	24.7	5.6	17.8	10.7

The per cent distribution of the number of establishments is not shown in this table; of the 749 establishments reported for all industries, 9.6 per cent employed no wage earners; 59.4 per cent, 1 to 5; 18.6 per cent, 6 to 20; and 12.4 per cent, 21 or over. The most numerous single group consists of the 445 establishments employing from 1 to 5 wage earners, and the next of the 139 establishments employing from 6 to 20 wage earners. There were seven establishments that employed over 250 wage earners, and only one that employed over 1,000.

Of the total number of wage earners, 35.4 per cent were in establishments employing over 250 wage earners. The single group having the largest number of employees was the group comprising the establishments employing from 501 to 1,000 wage earners. This group employed 2,408 wage earners, or 20.4 per cent of the total. Of the three industries listed in this table, but not in the preceding one, the steam-railroad repair shops is an industry in which compara-

tively large establishments do most of the business, as appears from the classification according to the number of wage earners.

**Expenses.**—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses which make up the total.

The following table shows, for 1909, in percentages, the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II.

This table shows that, for all industries combined, 76.1 per cent of the total expense was incurred for materials, 19.1 per cent for services—that is, salaries and wages—and but 4.8 per cent for other purposes. As would be expected, these proportions vary greatly in the different industries.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries.....	3.6	15.5	76.1	4.8
Bread and other bakery products.....	3.4	15.6	70.8	10.2
Butter, cheese, and condensed milk.....	2.3	6.4	88.4	2.9
Canning and preserving.....	6.4	12.5	72.7	8.3
Cars and general shop construction and repairs by steam-railroad companies.....	2.4	51.2	44.7	1.7
Confectionery.....	10.0	11.0	69.7	9.4
Flour-mill and gristmill products.....	1.8	4.7	90.7	2.8
Foundry and machine-shop products.....	5.8	37.7	50.1	6.4
Lumber and timber products.....	4.1	37.5	53.2	5.2
Printing and publishing.....	16.3	31.3	33.0	17.8
All other industries.....	2.8	12.7	80.6	4.0

**Engines and power.**—The following table shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 <sup>1</sup>	1909	1904	1899 <sup>1</sup>	1909	1904	1899
<b>Primary power, total.....</b>	<b>1,351</b>	<b>365</b>	<b>392</b>	<b>42,947</b>	<b>19,397</b>	<b>12,674</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Owned.....	462	365	392	32,307	16,456	11,071	75.2	84.8	87.4
Steam.....	352	250	273	28,984	12,162	7,656	67.5	62.7	60.0
Gas.....	27	11	7	226	59	89	0.5	0.3	0.7
Water wheels.....	81	91	112	2,926	3,221	3,366	6.8	16.6	26.6
Water motors.....	2	4	( <sup>2</sup> )	71	31	( <sup>2</sup> )	0.2	0.2	( <sup>2</sup> )
Other.....				100	983	10	0.2	5.1	0.1
Rented.....	889	( <sup>2</sup> )	( <sup>2</sup> )	10,640	2,941	1,603	24.8	15.2	12.6
Electric.....	889	( <sup>2</sup> )	( <sup>2</sup> )	10,592	2,941	1,588	24.7	15.2	12.5
Other.....				48		15	0.1		0.1
Electric motors.....	1,192	60	34	15,402	4,272	2,820	100.0	100.0	100.0
Run by current generated by establishment.....	303	60	34	4,810	1,331	1,241	31.2	31.2	43.0
Run by rented power.....	889	( <sup>2</sup> )	( <sup>2</sup> )	10,592	2,941	1,588	68.8	68.8	56.1

<sup>1</sup> Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.

<sup>2</sup> Not reported.

The table indicates a very large increase in primary power, most of which occurred during the five-year period 1904-1909. This increase is practically represented by the growth in steam and rented electric power. The figures show that 71.4 per cent of the total increase in primary power was in that generated by steam engines. This kind of power formed 67.5 per cent of the total horsepower in 1909, as compared with 62.7 per cent in 1904 and 60 per cent in 1899. Water power, directly applied, decreased throughout the decade. The increase in the practice of renting power is most conspicuous, 24.8 per cent of the total power being rented in 1909, as against 15.2 per cent in 1904 and 12.6 per cent in 1899. The use of electric motors for the purpose of applying the power generated within the establishments is also shown to be rapidly increasing.

**Fuel.**—Closely related to the question of kind of power employed is that of the fuel used in generating this power, or otherwise as material in the manufacturing processes. The following table shows the quantity of each kind of fuel used in 1909, by totals for all industries and for certain selected industries:

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gasoline (barrels).	Gas (1,000 feet).
<b>All industries<sup>1</sup>.....</b>	<b>492</b>	<b>1,756,107</b>	<b>167,007</b>	<b>2,032</b>	<b>6,791</b>	<b>9,543</b>
Beet sugar.....		82,781	2,574			392
Bread and other bakery products.....	182	2,012	1,100	353		
Brick and tile.....		884,562		1,047	2	
Butter, cheese, and condensed milk.....	61	4,474		203	6	2,217
Canning and preserving.....		3,462			145	
Cars and general shop construction and repairs by steam-railroad companies.....	9	36,698	997		686	
Confectionery.....		2,013	326	5	7	1,582
Flour-mill and gristmill products.....		2,024			5	
Foundry and machine-shop products.....		1,177	1,483	45	15	
Gas, illuminating and heating.....		25,201			6,354	
Lumber and timber products.....		1,014				
Printing and publishing.....		3,869		33	30	4,637
Smelting and refining, lead.....		62,261	88,063	62		
All other industries.....	240	642,379	71,624	284	162	715

<sup>1</sup> In addition, there were 32 tons of other varieties of fuel reported.

SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

(With statistics for laundries and custom gristmills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and value of materials and products which do not appear on the general schedule. Certain data of this character for four important industries in Utah are here presented.

**Butter, cheese, and condensed milk.**—The quantity and value of the different products of the butter, cheese, and condensed-milk establishments for 1909, 1904, and 1899 are given in the following table:

PRODUCT.	1909	1904 <sup>1</sup>	1899
<b>Total value</b> .....	<b>\$1,971,081</b>	<b>\$963,811</b>	<b>\$718,889</b>
<b>Butter:</b>			
<b>Packed solid—</b>			
Pounds.....	650,707	281,276	332,865
Value.....	\$193,311	\$33,100	\$62,872
<b>Prints and rolls—</b>			
Pounds.....	3,072,077	3,421,911	2,186,340
Value.....	\$944,077	\$748,680	\$437,412
<b>Cream sold:</b>			
Pounds.....	1,114,836	55,046	318,880
Value.....	\$128,528	\$4,470	\$26,505
All other butter-factory products, value <sup>2</sup> ..	\$1,530	\$8,160	\$12,045
<b>Cheese:</b>			
<b>Full cream—</b>			
Pounds.....	<sup>3</sup> 1,060,122	1,089,730	1,874,179
Value.....	\$157,058	\$161,721	\$174,571
All other cheese-factory products, value <sup>4</sup> ..	\$467	\$479	\$484
All other products not specified, value.....	\$546,051	\$7,292	.....

<sup>1</sup> Does not include statistics for one establishment, to avoid disclosure of individual operations.

<sup>2</sup> Includes skimmed milk sold and casein.

<sup>3</sup> Includes small quantity of part cream cheese.

<sup>4</sup> Includes whey.

In 1909 butter and all other butter-factory products constituted 64.3 per cent of the total value of the products of this industry. From 1899 to 1909 the production of butter products increased steadily, while that of the cheese products declined.

**Canning and preserving.**—Canning and preserving as a factory industry is of comparatively recent origin, and has made rapid progress in Utah since 1899, the value of products increasing from \$300,349 in 1899 to \$801,958 in 1904 and \$1,059,487 in 1909.

The quantity and value of products, by classes, for 1909, 1904, and 1899, are given in the table following.

The largest individual product is tomatoes, comprising, in 1909, 57 per cent of the aggregate value of all products. There was an increase over 1904 in the number of cases of beans, peas, pumpkins, and all other vegetables packed. The table shows decreases from 1904 to 1909 in the quantities of all fruits canned except apples and berries. Of the 24 establishments embraced within this classification in 1909, tomatoes were reported by 20. Seven of these were exclusively engaged in canning tomatoes.

PRODUCT.	1909	1904 <sup>1</sup>	1899 <sup>2</sup>
<b>Total value</b> .....	<b>\$1,059,487</b>	<b>\$801,958</b>	<b>\$300,349</b>
<b>Canned vegetables:</b>			
<b>Total—</b>			
Cases.....	478,482	361,102	174,338
Value.....	\$776,136	\$659,500	\$271,488
<b>Beans—</b>			
Cases.....	15,892	5,303	.....
Value.....	\$33,084	\$8,220	.....
<b>Peas—</b>			
Cases.....	61,156	41,634	.....
Value.....	\$100,712	\$80,155	.....
<b>Pumpkins—</b>			
Cases.....	3,067	1,160	3,504
Value.....	\$5,900	\$2,276	\$8,125
<b>Tomatoes—</b>			
Cases.....	388,871	312,430	170,834
Value.....	\$603,808	\$566,678	\$263,363
All other—			
Cases.....	9,496	635	.....
Value.....	\$32,542	\$2,280	.....
<b>Canned fruits:</b>			
<b>Total—</b>			
Cases.....	13,303	39,329	9,746
Value.....	\$32,365	\$91,486	\$23,281
<b>Apples—</b>			
Cases.....	4,191	2,346	2,053
Value.....	\$9,056	\$4,687	\$5,537
<b>Berries—</b>			
Cases.....	1,674	1,012	693
Value.....	\$3,463	\$2,684	\$1,657
<b>Peaches—</b>			
Cases.....	2,543	17,845	1,271
Value.....	\$5,800	\$43,868	\$3,392
<b>Pears—</b>			
Cases.....	1,742	8,300	2,540
Value.....	\$7,108	\$21,079	\$6,904
All other—			
Cases.....	3,153	9,826	2,319
Value.....	\$6,032	\$19,368	\$5,731
All other products.....	\$250,980	\$50,763	\$5,580

<sup>1</sup> Does not include statistics for two establishments, the value of whose products, however, would add about 4 per cent to the total shown, to avoid disclosure of individual operations.

<sup>2</sup> Does not include statistics for one establishment, the value of whose products, however, would add but about 7 per cent to the total shown, to avoid disclosure of individual operations.

**Flour-mill and gristmill products.**—The following tabular statement gives the quantities and values of the various products of this industry for the last two census years:

PRODUCT.	QUANTITY.		VALUE.	
	1909	1904	1909	1904
<b>Total value</b> .....			<b>\$3,130,805</b>	<b>\$2,425,791</b>
<b>Wheat flour:</b>				
White.....barrels..	451,789	449,770	2,316,067	1,946,384
Graham.....barrels..	7,469	4,025	38,442	16,938
Corn meal.....barrels..	259	1,457	1,290	5,316
Rye flour.....barrels..	365	546	2,038	2,232
Barley meal.....pounds..	4,397,690	14,000	86,348	306
Feed.....tons..	5,544	13,181	144,350	75,000
Oatflour.....tons..	21,740	22,460	444,161	368,171
All other products.....			97,650	15,850

<sup>1</sup> Includes grits.

Wheat flour, including white and Graham, was the most important product at both censuses, its value forming 75.2 per cent of the total value of products for the industry in 1909 and 80.9 per cent in 1904, having

increased in value \$391,787, or 20 per cent, during the five years. Barley meal shows a remarkable increase, both in quantity and value; corn meal shows a decrease in both items; and offal, while showing a decrease in quantity, shows an increase in value.

**Printing and publishing.**—The following table shows the number of publications and their aggregate circulation by period of issue, for 1909, 1904, and 1899:

PERIOD OF ISSUE.	NUMBER OF PUBLICATIONS.			AGGREGATE CIRCULATION PER ISSUE.		
	1909	1904	1899	1909	1904	1899
Total.....	94	88	74	261,937	228,126	123,279
Daily.....	8	10	6	57,498	42,282	24,163
Sunday.....	3	3	2	45,428	34,200	(1)
Semiweekly <sup>2</sup> .....	8	7	8	35,863	40,252	32,630
Weekly.....	65	57	49	71,542	65,742	36,036
Monthly.....	8	7	4	48,033	30,000	13,800
All other classes.....	2	4	5	3,573	15,650	16,650

<sup>1</sup> Included in circulation for daily.

<sup>2</sup> Includes three triweeklies in 1909, and one each in 1904 and 1899.

The number of newspapers and periodicals in the state increased from 74 in 1899 to 88 in 1904 and 94 in 1909. The aggregate circulation per issue in 1909 of the newspapers and periodicals of the state was 261,937, as compared with 228,126 in 1904 and 123,279 in 1899. The only publications which decreased in circulation from 1904 to 1909 were the semiweeklies and triweeklies and the publications included under

the head of "All other classes." All of the publications were in the English language, except four weeklies, one of which was in German, one in Japanese, and two in Swedish.

**Laundries.**—Statistics for steam laundries are not included in the general tables or in the totals for manufacturing industries. There were 22 such establishments in the state of Utah, 7 of which were in Salt Lake City and 4 in Ogden. The following statement summarizes the statistics:

Number of establishments.....	22
Persons engaged in the industry.....	811
Proprietors and firm members.....	16
Salaried employees.....	57
Wage earners (average number).....	738
Primary horsepower.....	969
Capital.....	\$500,276
Expenses.....	684,434
Services.....	415,809
Materials.....	143,041
Miscellaneous.....	126,084
Amount received for work done.....	794,091

Ten of the 22 establishments were under individual ownership, 9 under corporate ownership, and 3 under firm ownership. Eight establishments had receipts for the year's business of less than \$5,000; 6, receipts of \$5,000, but less than \$20,000; and 8, receipts of \$20,000 and over.

The number of wage earners employed each month and the per cent which this number represented of the greatest number employed in any month were as follows:

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	699	83.4	July.....	814	97.1
February.....	690	82.3	August.....	838	100.0
March.....	690	82.3	September.....	759	90.6
April.....	693	82.7	October.....	742	88.5
May.....	700	83.5	November.....	742	88.5
June.....	740	88.3	December.....	744	88.8

The different kinds of primary power, the number of engines, and the amount of horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines or motors.	Horse-power.
<b>Primary power, total.....</b>		<b>969</b>
Owned—Steam.....	20	927
Rented—Electric.....	10	42

The kind and amount of fuel used are shown in the following statement:

KIND.	Unit.	Quantity.
Anthracite coal.....	Tons.....	257
Bituminous coal.....	Tons.....	8,978
Oil.....	Barrels.....	18
Gas.....	1,000 feet.....	272

Custom gristmills.—Statistics for custom gristmills are not included in the general tables or in the totals for manufacturing industries, but are presented in the following summary:

Number of establishments.....	19
Persons engaged in industry.....	37
Proprietors and firm members.....	20
Salaried employees.....	5
Wage earners (average number).....	12
Primary horsepower.....	709
Capital.....	\$180,730
Expenses.....	208,637
Services.....	10,506
Materials.....	<sup>1</sup> 192,268
Miscellaneous.....	5,863
Value of products.....	<sup>1</sup> 247,360

<sup>1</sup> Includes estimate of all grain ground.

STATISTICS OF MANUFACTURES—UTAH.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.  
THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Cen- sus.	Num- ber of estab- lish- ments.	PERSONS ENGAGED IN INDUSTRY.				Pri- mary horse- power.	Capital.	Sala- ries.	Wages.	Cost of mate- rials.	Value of prod- ucts.	Value added by manu- fac- ture.						
			Total.	Pro- pri- etors and firm mem- bers.	Sala- ried em- ploe- ees.	Wage con- triers (aver- age num- ber).								Expressed in thousands.					
														1909	1904	1899	1909	1904	1899
STATE—All industries.....	1909 1904 1899	749 606 575	14,138 9,660	688 619	1,060 979 599	11,785 8,052 5,413	42,047 19,397 12,674	\$52,627 26,004 13,219	\$1,966 1,033 601	\$8,400 5,167 2,763	\$41,266 24,940 11,440	\$61,989 38,926 17,982	\$20,728 13,986 6,542						
Bread and other bakery products.....	1909 1904 1899	53 28 29	412 233 157	91 28 30	39 14 20	282 191 107	115 77	1,205 353 210	36 13 10	165 90 46	747 281 142	1,214 542 291	467 261 149						
Brick and tile.....	1909 1904 1899	34 30 49	585 359 337	40 53 77	31 15 11	514 291 249	1,550 737 207	1,100 438 171	31 13 7	332 173 89	136 68 33	693 345 188	547 278 163						
Butter, cheese, and condensed milk.....	1909 1904 1899	37 49 57	285 169 252	25 38 39	46 23 54	214 98 169	635 813 616	1,134 406 269	42 16 16	116 55 63	1,613 789 550	1,971 904 714	358 175 164						
Canning and preserving.....	1909 1904 1899	24 18 18	461 411 169	7 6 8	58 36 20	396 369 141	847 500 310	1,161 928 304	63 25 8	123 99 38	716 506 211	1,059 802 300	343 296 89						
Cars and general shop construction and repairs by steam-railroad companies.....	1909 1904 1899	8 7 10	1,700 1,337 964	..... ..... .....	50 80 40	1,731 1,248 908	1,735 354 315	959 522 496	66 93 49	1,402 964 636	1,225 827 605	2,740 1,887 1,307	1,515 1,060 702						
Confectionery.....	1909 1904 1899	17 12 9	745 406	9 16	150 54 45	536 335 153	532 222	1,009 401 143	185 52 26	204 103 51	1,291 683 208	1,952 1,005 403	661 317 105						
Flour-mill and gristmill products.....	1909 1904 1899	60 63 65	282 278	41 80	57 48 47	184 160 149	3,312 3,047 979	2,042 1,212 979	50 27 31	131 62 75	2,511 2,043 1,201	3,131 2,426 1,669	629 383 368						
Foundry and machine-shop products.....	1909 1904 1899	27 21 15	428 321 181	20 19 21	35 26 7	373 277 153	541 99	877 451 210	47 43 10	306 198 92	407 248 64	922 587 217	515 339 153						
Hosiery and knit goods.....	1909 1904 1899	11 10 5	212 214 108	6 4 4	32 39 13	174 171 91	80 25 5	311 199 53	28 28 5	53 48 22	292 167 24	419 326 66	127 169 42						
Leather goods.....	1909 1904 1899	19 15 11	151 111	18 21	18 10 12	115 80 80	24 3	261 112 154	21 8 7	75 46 39	259 107 111	420 222 190	167 115 70						
Liquors, malt.....	1909 1904 1899	5 6 7	215 165 115	2 3 4	35 28 22	178 134 89	800 323 266	1,170 898 614	70 44 21	157 93 54	290 176 121	1,357 937 433	1,067 461 312						
Lumber and timber products.....	1909 1904 1899	104 53 76	629 291	150 88	48 21 21	431 182 367	2,922 1,380	915 245 350	34 15 11	396 105 134	435 139 166	977 334 439	542 195 273						
Marble and stone work.....	1909 1904 1899	25 9 7	153 74	28 14	9 3 6	121 57 32	399 225	188 62 36	14 3 3	106 39 19	91 36 30	270 102 68	179 66 38						
Pottery, terra-cotta, and fire-clay products....	1909 1904 1899	3 6 7	105 42 46	1 3 8	8 5 2	96 34 36	207 175 150	236 91 38	9 6 2	56 20 11	57 29 6	105 77 29	138 48 23						
Printing and publishing.....	1909 1904 1899	122 104 83	1,475 873	91 94	417 294 95	967 545 563	1,357 262	2,022 1,081 835	302 294 83	685 369 294	723 325 200	2,405 1,523 795	1,682 1,198 589						
Salt.....	1909 1904 1899	9 5 5	75 88 71	7 6 4	12 14 8	56 68 59	474 188 108	888 613 647	19 19 11	38 44 24	53 31 32	184 237 139	131 186 107						
Slaughtering and meat packing.....	1909 1904 1899	12 3 8	160 41 62	7 1 14	44 9 6	99 31 42	572 25 69	564 148 117	38 10 2	77 21 19	1,327 514 385	1,000 653 463	363 139 68						
Tobacco manufactures.....	1909 1904 1899	28 27 15	196 182 85	29 33 17	15 0	152 140 68	..... ..... .....	249 166 46	15 7	112 109 38	165 111 50	385 298 124	220 187 74						
All other industries.....	1909 1904 1899	151 132 109	5,779 4,066	116 112	547 303 164	5,116 3,651 1,977	20,719 10,942	36,290 17,738 7,548	837 382 199	3,956 2,490 1,019	28,928 17,835 7,205	40,069 25,958 10,166	11,081 8,123 2,964						

<sup>1</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.  
<sup>2</sup> Excluding statistics for two establishments, to avoid disclosure of individual operations.

# STATISTICS OF MANUFACTURES—UTAH.

17

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

**CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.**

INDUSTRY.	Cen- sus.	Num- ber of estab- lish- ments.	PERSONS ENGAGED IN INDUSTRY.				Pri- mary horse- power.	Capital.	Sala- ries.	Wages.	Cost of mate- rials.	Value of prod- ucts.	Value added by manu- fac- ture.
			Total.	Pro- pri- etors and firm mem- bers.	Sala- ried em- ploe- ees.	Wage earn- ers (aver- age num- ber).							
Expressed in thousands.													
<b>SALT LAKE CITY—All Industries.</b>	1909	245	5,328	160	881	4,227	6,603	\$13,538	\$915	\$3,010	\$6,615	\$13,351	\$6,736
	1904	193	3,438	170	492	2,776	.....	6,837	522	1,704	3,615	7,544	4,029
	1899	154	.....	.....	266	2,154	.....	3,356	233	1,177	1,977	4,279	2,302
Bread and other bakery products.....	1909	24	275	27	28	220	80	1,111	27	122	509	618	349
	1904	15	166	13	10	143	.....	206	12	67	218	422	204
	1899	16	106	15	14	77	.....	174	0	34	101	213	112
Confectionery.....	1909	0	512	3	119	300	360	648	140	135	955	1,409	454
	1904	0	289	11	44	234	.....	305	41	70	534	760	226
	1899	0	.....	.....	36	111	.....	115	18	35	158	303	145
Copper, tin, and sheet-iron products.....	1909	11	128	15	9	104	10	84	11	85	105	258	153
	1904	7	63	7	5	51	.....	26	3	30	43	113	70
	1899	4	.....	.....	1	37	.....	18	1	23	42	83	46
Foundry and machine-shop products.....	1909	19	344	13	30	301	404	760	42	257	316	751	435
	1904	13	277	10	23	244	.....	393	41	177	223	524	301
	1899	9	140	12	7	127	.....	179	10	81	52	181	129
Leather goods.....	1909	10	82	11	11	60	10	81	15	43	179	279	109
	1904	9	71	11	6	54	.....	61	6	28	63	131	68
	1899	15	.....	.....	8	41	.....	51	6	22	65	106	41
Lumber and timber products.....	1909	8	161	1	24	136	375	304	21	117	169	370	207
	1904	5	74	5	10	59	.....	100	12	38	50	132	82
	1899	3	35	1	0	28	.....	34	5	21	26	64	38
Printing and publishing.....	1909	40	1,126	22	358	746	1,207	1,057	314	561	615	1,083	1,368
	1904	43	587	28	107	362	.....	744	199	273	257	1,236	979
	1899	29	.....	.....	71	423	.....	645	65	237	162	607	445
Tobacco manufactures.....	1909	16	129	14	12	103	.....	122	12	68	112	251	139
	1904	14	112	16	7	89	.....	64	5	63	62	171	109
	1899	8	56	9	.....	47	.....	20	.....	20	30	94	55
All other industries.....	1909	99	2,571	54	206	2,227	4,247	3,771	333	1,022	3,595	7,120	3,531
	1904	77	1,799	69	190	1,540	.....	3,348	203	943	2,605	4,055	1,990
	1899	74	.....	.....	123	1,203	.....	2,111	119	695	1,332	2,023	1,201

**CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES COMBINED.**

<b>Ogden.....</b>	1909	68	1,539	58	158	1,323	2,506	\$2,321	\$174	\$873	\$2,006	\$3,713	\$1,647
	1904	63	1,183	66	104	1,013	.....	1,521	102	711	1,398	2,507	1,109
	1899	51	.....	.....	56	678	.....	857	47	355	679	1,242	563

<sup>1</sup> Excluding statistics for two establishments, to avoid disclosure of individual operations.  
<sup>2</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.  
<sup>3</sup> Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

STATISTICS OF MANUFACTURES—UTAH.

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Primary horse-power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks		Wage earners.			Total.	10 and over.		Under 10.				
					Male.	Female.	Average number.	Number.			Male.	Female.	Male.	Female.			
								Maximum month.	Minimum month.								
1 All industries.....	749	14,133	888	533	923	204	11,785	Se 13,277	Fe 10,449	(1)	(1)	(1)	(1)	(1)	42,047		
2 Artificial stone.....	3	8	2	2			4	Ap <sup>2</sup> 7	Oc <sup>2</sup> 4	7	7				3		
3 Bread and other bakery products.....	53	412	91	9	17	13	282	No 309	Fe 261	302	247	53	3		115		
4 Brick and tile.....	34	595	40	15	10		514	Ja 758	Ja 267	581	551		33		1,556		
5 Butter, cheese, and condensed milk.....	37	285	25	19	19	8	214	Se 228	Ja 195	204	173	31			635		
6 Canning and preserving.....	24	401	7	32	17	9	306	Se 1,256	Fe 69	1,240	488	0'0	29	39	847		
7 Cars and general shop construction and repairs by steam-railroad companies.	3	1,790		11	40	2	1,731	De 1,803	Jy 1,049	1,823	1,823				1,735		
8 Clothing, men's, including shirts.....	8	75	4	4	7	2	58	My 62	Ja 49	56	2	54			21		
9 Confectionery.....	17	745	9	25	99	26	580	De 718	Fe 520	717	217	495		5	532		
10 Flour-mill and gristmill products.....	60	282	41	38	16	3	184	Oc 203	Ap 170	200	200				3,312		
11 Foundry and machine-shop products.....	27	428	20	20	12	3	373	Se 435	Mh 307	375	375				541		
12 Furniture and refrigerators.....	3	73	1	5	2	3	62	Au 68	Ja 59	68					81		
13 Gas, illuminating and heating.....	3	201		6	27	1	167	Jy 201	Fe 115	138	138				291		
14 Hosiery and knit goods.....	11	212	6	15	8	9	174	No 228	Ja 125	214	36	175	3		84		
15 Ice, manufactured.....	4	38	1	7			20	Jy 32	Ja <sup>2</sup> 13	26	26				474		
16 Leather goods.....	19	151	18	10	6	2	115	Ap 119	Ja <sup>2</sup> 113	87	84	1	2		21		
17 Lime.....	12	42	9	3	5	1	74	No 90	Ja 36	104	104				50		
18 Liquors, malt.....	5	215	2	14	19	2	178	Au 214	Fe 152	161	161				860		
19 Lumber and timber products.....	104	629	150	37	16	5	431	Se 593	Fe 300	753	742	8	3		2,922		
20 Marble and stone work.....	25	168	28	7	2		121	Se 159	Ja 67	132	129	3			399		
21 Mattresses and spring beds.....	3	75	2	5	3		65	No 74	Ja 55	62	52	10			171		
22 Patent medicines and compounds and druggists' preparations.	7	20	8	1	1	1	9	Jy <sup>2</sup> 16	Oc 5	14	7	3	4				
23 Pottery, terra-cotta, and fire-clay products.	3	105	1	4	3	1	90	No 100	My 80	99	99				267		
24 Printing and publishing.....	122	1,475	91	78	270	63	907	De 1,004	Jy 925	1,017	859	130	23		1,357		
25 Salt.....	9	75	7	9	3		56	Jy 103	Ja 14	80	74	6			474		
26 Slaughtering and meat packing.....	12	150	7	17	24	3	99	De 111	Ap 86	111	110		1		572		
27 Tobacco manufactures.....	28	195	29	6	7	2	152	Fe 165	No 139	151	117	31	2	1			
28 All other industries <sup>3</sup> .....	113	5,207	89	144	272	45	4,657								25,658		

<sup>1</sup> No figures given for reasons explained in the Introduction, page 2. See also discussion of wage earners on page 6.

<sup>2</sup> Same number reported for one or more other months.

<sup>3</sup> All other industries embrace—

Awnings, tents, and sails.....	5	Copper, tin, and sheet-iron products.....	18	Oil, not elsewhere specified.....	1
Baskets, and rattan and willow ware.....	1	Cordials and sirups.....	1	Optical goods.....	1
Beet sugar.....	5	Fertilizers.....	2	Paint and varnish.....	1
Blacking and cleansing and polishing preparations.	1	Flavoring extracts.....	2	Pens, fountain, stylographic, and gold.....	1
Boots and shoes, including cut stock and findings.	2	Food preparations.....	5	Roofing materials.....	1
Boxes, cigar.....	1	Fur goods.....	2	Scales and balances.....	2
Boxes, fancy and paper.....	1	Gas and electric fixtures and lamps and reflectors.	2	Smelting and refining, copper.....	2
Brass and bronze products.....	2	Glass, cutting, staining, and ornamenting.....	1	Smelting and refining, lead.....	3
Brooms.....	1	Gloves and mittens, leather.....	1	Soap.....	1
Carpets, rag.....	1	Grease and tallow.....	1	Surgical appliances and artificial limbs.....	1
Carriages and wagons and materials.....	2	Hand stamps and stencils and brands.....	1	Vinegar and cider.....	1
Cars and general shop construction and repairs by street-railroad companies.....	2	Jewelry.....	1	Wall plaster.....	2
Cement.....	2	Lapidary work.....	1	Wirework, including wire rope and cable.....	3
Coffee and spice, roasting and grinding.....	1	Lead, bar, pipe, and sheet.....	1	Woolen, worsted, and felt goods, and wool hats.....	1
Coffins, burial cases, and undertakers' goods.....	2	Leather, tanned, curried, and finished.....	2		
Coke.....	1	Mineral and soda waters.....	16		
Cooperage and wooden goods, not elsewhere specified.....	1	Mirrors.....	1		
		Models and patterns, not including paper patterns.....	2		
		Musical instruments and materials, not specified.....	1		

STATISTICS OF MANUFACTURES—UTAH.

19

THE STATE, BY INDUSTRIES: 1909.

Capital.	EXPENSES.										Value of products.	Value added by manufacture.	
	Total.	Services.			Materials.		Miscellaneous.						
		Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.			
1	\$52,026,640	\$54,207,344	\$908,154	\$1,058,265	\$5,399,634	\$3,870,869	\$37,385,702	\$170,573	\$504,657	\$104,176	\$1,787,924	\$61,989,277	\$20,723,816
2	13,219	7,384	1,134	2,370	44	3,480	180	110	-----	-----	60	0,356	5,832
3	1,204,588	1,055,270	12,210	23,146	164,935	23,498	723,743	18,781	3,797	2,612	82,648	1,214,185	460,944
4	1,189,606	520,268	17,644	13,380	331,018	106,923	28,577	50	3,810	-----	17,906	683,087	547,587
5	1,133,963	1,823,740	20,484	15,645	116,354	14,201	1,598,751	3,295	2,815	-----	46,195	1,971,031	358,079
6	1,161,399	984,198	44,470	18,919	123,359	12,242	703,520	1,600	6,022	3,500	70,557	1,059,487	343,710
7	953,753	2,740,400	22,812	43,085	1,402,134	90,713	1,125,407	-----	17,819	1,020	27,870	2,740,463	1,515,343
8	99,559	107,077	3,900	7,315	14,990	2,530	73,147	1,020	1,575	-----	3,500	119,452	43,775
9	1,009,257	1,853,175	45,560	130,377	203,645	17,279	1,273,990	21,870	5,233	-----	145,182	1,951,863	660,585
10	2,041,614	2,769,128	34,824	15,287	130,911	23,232	2,487,398	2,895	12,217	200	62,164	3,130,895	620,265
11	877,441	811,877	32,615	14,324	306,148	39,468	307,287	6,860	4,742	-----	40,433	922,125	515,379
12	208,598	210,865	7,708	4,567	53,703	2,010	120,282	5,420	125	-----	13,960	277,720	140,428
13	4,162,299	351,073	13,970	22,500	108,139	111,746	56,423	-----	8,733	-----	30,132	365,855	197,686
14	311,224	390,342	16,501	11,470	52,792	3,307	289,066	2,048	-----	-----	12,570	419,229	126,856
15	402,401	67,733	10,000	-----	15,993	21,420	7,600	-----	3,310	-----	8,805	93,190	64,170
16	261,293	373,531	12,565	8,604	74,657	1,117	258,325	6,475	2,410	1,115	8,263	425,735	166,293
17	112,037	93,856	2,400	3,615	52,857	24,153	5,346	400	676	486	3,923	114,880	85,381
18	1,176,176	1,095,640	35,380	34,412	157,278	41,164	248,443	3,300	178,211	-----	307,452	1,357,089	1,067,482
19	915,418	817,451	23,878	0,509	300,181	13,459	421,448	3,011	6,162	4,168	20,237	976,589	541,082
20	188,322	222,464	13,075	1,375	100,075	3,927	86,712	455	1,207	1,710	7,028	270,005	170,395
21	153,801	200,663	12,650	3,598	41,012	3,464	126,000	-----	1,003	-----	12,840	233,440	103,880
22	25,525	25,272	1,500	1,600	3,637	185	12,835	2,070	235	315	2,895	31,942	18,922
23	230,093	138,900	0,580	2,570	55,577	25,341	31,160	-----	1,983	5,385	10,304	194,834	138,393
24	2,022,354	2,154,540	123,192	238,413	685,443	41,863	681,398	50,137	15,144	60,095	252,855	2,404,602	1,081,341
25	837,975	144,304	15,460	3,820	37,535	13,352	30,017	900	1,138	12,497	10,835	183,843	130,574
26	564,496	1,534,639	10,565	18,399	79,071	17,742	1,309,052	3,624	4,464	-----	85,122	1,694,446	363,652
27	248,667	344,659	8,510	0,700	111,832	561	164,822	4,557	20,889	4,537	22,241	385,245	219,852
28	31,112,692	33,461,209	342,939	396,226	3,663,483	3,215,928	25,132,549	33,715	199,688	0,030	461,251	38,762,609	10,414,222

## MANUFACTURES : VERMONT

## STATISTICS OF MANUFACTURES FOR THE STATE, CITIES, AND INDUSTRIES

Prepared under the supervision of W. M. STEUART, Chief Statistician for Manufactures

## INTRODUCTION.

This advance bulletin gives the statistics of manufactures for the state of Vermont for the calendar year 1909 as shown by the Thirteenth Census. It will be reprinted without change as a part of the Compendium of the Census for Vermont and in the final reports of the Thirteenth Census.

The text summarizes the general results of the census inquiry, presenting a series of special tables in which the main facts printed in the general tables are given in convenient form for the state as a whole and for important industries. It also presents tables in which the statistics for the industries of the state as a whole and for a few important industries are classified by character of ownership, size of establishments, number of wage earners, and prevailing hours of labor, information which could not be presented in general tables for each industry without disclosing the facts for individual establishments.

At the end of the bulletin are two general tables.

Table I gives for 1909, 1904, and 1899 the number of establishments and of persons engaged in the industries, primary power, capital, salaries and wages, cost of materials, value of products, and value added by manufacture reported for all industries combined and for certain important industries for the state as a whole. It also gives the same items for all industries combined for the three cities having in 1910 a population of 10,000 or over.

Table II gives statistics in detail for 1909 for the state and for a larger number of industries.

**Scope of census: Factory industries.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of organization, location of establishments, size of establishments, labor force, and similar subjects. When use is made of the data for these purposes, it is imperative that due attention should be given to the limitations of the figures. Particularly is this true when the attempt is made to derive from them figures purporting to show average wages, cost of production, or profits. These limitations will be fully discussed in the general report on manufactures for the United States as a whole. It is impossible to reproduce such discussion in the bulletins relative to the individual states.

The census of 1909, like that of 1904, was confined to manufacturing establishments conducted under the factory system, as distinguished from the neighborhood, hand, and building industries. Where statistics for 1899 are given they have been reduced to a

comparable basis by eliminating the latter classes of industries. The census does not include establishments which were idle during the entire year, or had a value of products of less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions, or in governmental establishments, except those of the Federal Government.

**Period covered.**—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—The term "establishment" comprises the factories, mills, or plants, which are under a common ownership or control, and for which one set of books of account is kept.

If, however, the plants constituting an establishment as thus defined were not all located within the same city or state, separate reports were secured in order that the separate totals might be included in the statistics for each city or state. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products very different from those covered by the class designation, and, on the other hand, may not include the total product covered by this designation, because some part of this product may be made in establishments in which it is not the product of chief value.

**Selected industries.**—The general tables at the end of this bulletin give the principal facts separately for the industries of the state. A selection has been made of the leading industries of the state for more detailed consideration. Sometimes an industry of greater importance than some of those selected is omitted, because it comprises so few establishments that these detailed presentations would reveal the operations of individual concerns.

**Comparisons with previous censuses.**—Owing to the changes in industrial conditions it is not always possible to classify establishments by industries in such a way as to permit accurate comparison with preceding censuses. Table I, giving comparable figures for 1909, 1904, and 1899, therefore, does not embrace all the industries shown for 1909 in Table II.

**Influence of increased prices.**—In considering changes in cost of materials, value of products, and value added by manufacture, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures can not be taken as an exact measure of increase in the volume of business.

**Persons engaged in industry.**—At the censuses of 1909, 1904, and 1899 the following general classes of persons engaged in manufacturing industries have been distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks, and (5) wage earners. In the censuses of 1904 and 1899 these five classes were shown according to the three main groups: (1) Proprietors and firm members, (2) salaried officials, clerks, etc., and (3) wage earners. The second group included the

three classes of salaried officers of corporations, superintendents and managers, and clerks. In the present census an entirely different grouping is employed: That into (1) proprietors and officials, (2) clerks, and (3) wage earners. The first group includes proprietors and firm members, salaried officers of corporations, and superintendents and managers.

At this census the number of persons engaged in the industries, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for December 15, or the nearest representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where conditions were exceptional, and particularly in the case of certain seasonal industries, such as canning, the December date could not be accepted as typical and an earlier date had to be chosen.

In the case of employees other than wage earners the number thus reported on December 15 or other representative day has been treated as equivalent to the average for the year, since the number of employees of this class does not vary much from month to month in a given industry. In the case of wage earners the average is obtained in the manner explained in the next paragraph.

**Wage earners.**—In addition to the report by sex and age of the number of wage earners on December 15 or other representative day, a report was obtained of the number employed on the 15th of each month, without distinction of sex or age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported each month by 12. The average thus obtained represents the number of wage earners that would be required to perform the work done if all were constantly employed during the entire year. Accordingly, the importance of any industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given for each separate industry, is not totaled for all industries combined, because in view of the variations of date such a total is believed not to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In particular, totals by sex and age for the wage earners reported for the representative day would be misleading because of the undue weight given to seasonal industries, in some of which, such as canning and preserving, the distribution of the wage earners by sex and age is materially different from that in most industries of more regular operation. In order to determine as nearly as possible the sex and age distribution of the average number of wage earners in the state as a whole, the following procedure has been adopted:

The percentage distribution by sex and age of the wage earners in each industry, for December 15 or the nearest representative day, has been calculated from the actual numbers reported for that date. This percentage has been applied to the average number of wage earners for the year in that industry, to determine the average number of men, women, and children employed. These calculated averages for the several industries have been added up to give the average distribution for the state as a whole.

In 1899 and 1904 the schedule called for the average number of wage earners of each sex 16 years and over, and the total number under 16 years of age, for each month, and these monthly statements were combined in an annual average. Comparatively few manufacturing concerns, however, keep their books in such way as to show readily the number of men, women, and children (under 16) employed each month. These monthly returns by sex and age were, in fact, largely estimates. It was believed that a more accurate and reliable sex and age distribution could be secured by taking as a basis of estimate the actual numbers employed on a single day.

**Prevailing hours of labor.**—The census made no attempt to ascertain the number of employees working a given number of hours

per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one period to another are disregarded, and no attention is given to the fact that a limited number of employees may have hours differing from those of the majority. In the tables all the wage earners of each establishment are counted in the class within which the establishment itself falls. In most establishments, however, all or practically all the employees work the same number of hours, so that these figures give a substantially correct picture of the hours of labor in manufacturing industries.

**Capital.**—For reasons stated in prior census reports, the statistics of capital secured by the census canvass are so defective as to be without value, except as indicating very general conditions. The instructions on the schedule for securing capital were as follows:

The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises.

**Materials.**—Cost of materials refers to the materials used during the year, which may be more or less than the materials purchased during the year. The term "materials" includes fuel, rent of power and heat, mill supplies and containers, as well as materials forming a constituent part of the product. Fuel includes all fuel used, whether for heat, light, or power, or for the process of manufacture.

**Expenses.**—Under "Expenses" are included all items of expense incident to the year's business, except interest, whether on bonds or other forms of indebtedness, and allowances for depreciation.

**Value of products.**—The value of products for any industry includes the total value of all products manufactured in establishments whose products of chief value fall under the industry designation. The amounts given represent the selling value at the factory of all products manufactured during the year, which may differ from the value of the products sold. Amounts received for work on materials furnished by others are included.

**Value added by manufacture.**—The value of products is not a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing process carried on in the industry itself. Another part of it, and often by far the larger part, represents the value of the materials used, which have been produced by agriculture or mining or by other industrial establishments. For many purposes, therefore, the best measure of the importance of different classes of industry is the value created as the result of the manufacturing operations carried on within the industry. This value is obtained by deducting the cost of the materials consumed from the value of the product. The figure thus obtained is termed in the census reports "Value added by manufacture."

There is a further statistical advantage which "value added" has over gross value of products. In combining the value of products for all industries the value of products produced by one establishment and used as materials in another is duplicated, and the total, therefore, gives a greatly exaggerated idea of the wealth created. No such duplication takes place in the total "Value added by manufacture."

**Cost of manufacture and profits.**—Census data do not show the entire cost of manufacture, and consequently can not be used to show profits. No account has been taken of interest and depreciation. Even if the amount of profit could be determined by deducting the expenses from the value of the products the rate of profit on the investment could not properly be calculated, because of the very defective character of the returns regarding capital.

**Primary power.**—The figures given for this item show the total of the primary power used by the establishments. They do not cover the power developed by motors operated by such power, the inclusion of which would evidently result in duplication.

**Location of establishments.**—The Census Bureau has classified establishments by their location in cities or classes of cities. In interpreting these figures due consideration should be given to the fact that often establishments are located just outside the boundaries of cities, and are necessarily so classified, though locally they are looked upon as constituting a part of the manufacturing interests of the cities.

**Laundries.**—The census of 1909 was the first to include statistics of laundries. The reports are confined to establishments

using mechanical power. The data are presented separately and are not included in the general total for manufacturing industries, in order to avoid interference with comparisons with prior censuses.

**Custom grist and saw mills.**—In order to make the statistics for 1909 comparable with those for 1904 the data for these mills have been excluded from all the tables presenting general statistics, and are given in a separate table at the end of this report.

**INDUSTRIES IN GENERAL.**

**General character of the state.**—Vermont, with a gross area of 9,564 square miles, of which 440 represent water surface, is one of the smallest states in the Union, both in area and population. Its population in 1910 was 355,956, as compared with 343,641 in 1900 and 332,422 in 1890. It ranked forty-second among the 49 states and territories of continental United States as regards population in 1910 and thirty-ninth in 1900. In 1910 the density of population for the entire state was 39 persons per square mile, the corresponding figure for 1900 being 37.7. Forty-seven and five-tenths per cent of the total population of the state resided in incorporated places having a population of 2,500 or over, as against 40.5 per cent in 1900.

The state has three cities having a population of over 10,000, Burlington, Rutland, and Barre. These three cities contain only 12.6 per cent of the total population of the state and are credited with only 19.5 per cent of the total value of its manufactures. Apart from these cities 34.9 per cent of the population of the state resided in places of 2,500 inhabitants or over.

Vermont has good railroad service, and Lake Champlain furnishes excellent facilities for water transportation in the northwestern part of the state.

**Importance and growth of manufactures.**—The manufactures of the state have increased from a total value of products of \$8,571,000 in 1849-50 to \$51,515,000 in 1899 and \$68,310,000 in 1909. During 1849-50 an average of 8,445 wage earners, representing 2.7 per cent of the total population, were employed in manufactures, while in 1909 an average of 33,788 wage earners, or 9.5 per cent of the total population, were so engaged. During this period the gross value of products per capita of the total population of the state increased from \$27 to \$192. From 1849-50 to 1909, however, the proportion which the manufactures of the state represented of the total value of the products of manufacturing industries in the United States decreased somewhat. This proportion was eight-tenths of 1 per cent in 1849-50; five-tenths of 1 per cent in 1899; and three-tenths of 1 per cent in 1909. In 1849-50 the state ranked twenty-first in respect to value of manufactures, in 1899, thirty-fourth, and in 1909, thirty-eighth.

The following table gives the more important figures relative to all classes of manufactures combined for the state as returned at the censuses of 1909, 1904, and 1899, together with the percentages of increase from census to census:

	NUMBER OR AMOUNT.			PER CENT OF INCREASE. <sup>1</sup>	
	1909	1904	1899	1904-1909	1899-1904
Number of establishments.....	1,958	1,099	1,938	15.2	-12.3
Persons engaged in manufactures.....	38,580	37,015	( <sup>2</sup> )	4.2	( <sup>2</sup> )
Proprietors and firm members.....	2,113	1,856	( <sup>2</sup> )	13.8	( <sup>2</sup> )
Salaried employees.....	2,679	2,053	1,695	30.5	21.1
Wage earners (average number).....	33,788	33,106	28,179	2.1	17.5
Primary horsepower.....	159,445	140,616	126,124	13.4	11.5
Capital.....	\$73,470,000	\$62,659,000	\$43,500,000	17.3	44.0
Expenses.....	59,851,000	54,677,000	42,867,000	9.5	27.6
Services.....	20,075,000	17,324,000	13,038,000	15.9	32.9
Salaries.....	2,803,000	2,103,000	1,611,000	33.3	30.5
Wages.....	17,272,000	15,221,000	11,427,000	13.5	33.2
Materials.....	34,823,000	32,430,000	26,385,000	7.4	22.9
Miscellaneous.....	4,953,000	4,923,000	3,444,000	0.6	42.9
Value of products.....	68,310,000	63,084,000	51,515,000	8.3	22.5
Value added by manufacture (value of products less cost of materials).....	33,487,000	30,654,000	25,130,000	9.2	22.0

<sup>1</sup> A minus sign (-) denotes a decrease.

<sup>2</sup> Figures not available.

In 1909 the state of Vermont had 1,958 manufacturing establishments, which gave employment to an average of 38,580 persons during the year, and paid out \$20,075,000 in salaries and wages. Of the persons employed, 33,788 were wage earners. These establishments turned out products to the

value of \$68,310,000, to produce which materials costing \$34,823,000 were used. The value added by manufacture was thus \$33,487,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year.

In general, this table brings out the fact that the manufacturing industries of Vermont, when measured by value of products and value added by manufacture, showed less development during the more recent five-year period 1904-1909 than during the preceding five-year period 1899-1904. The number of establishments, however, dropped from 1,938 in 1899 to 1,699 in 1904, but had increased to 1,958 by 1909. In the earlier period wages increased 33.2 per cent and the value of products 22.5 per cent, whereas in the more recent period they increased only 13.5 per cent and 8.3 per cent, respectively. As pointed out in the Introduction, it would be improper to infer that manufactures increased in volume to the

full extent indicated by these figures representing values, since the increase shown is certainly due, in part, to the increase that has taken place in the price of commodities.

It is a matter of interest to note that the percentages of increase shown for wages, value of products, and value added by manufacture are much larger than the percentage of increase in the average number of wage earners. The only decrease shown in the table is that in the number of establishments during the period 1899-1904, amounting to 12.3 per cent.

The relative importance and growth of the leading manufacturing industries of the state are shown in the following table:

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.		PER CENT OF INCREASE. <sup>1</sup>			
		Average number.	Per cent distribution.	Amount.	Per cent distribution.	Amount.	Per cent distribution.	Value of products.		Value added by manufacture.	
								1904-1909	1899-1904	1904-1909	1899-1904
<b>All industries</b> .....	<b>1,958</b>	<b>33,788</b>	<b>100.0</b>	<b>\$68,310,000</b>	<b>100.0</b>	<b>\$33,487,000</b>	<b>100.0</b>	<b>8.3</b>	<b>22.5</b>	<b>9.2</b>	<b>22.0</b>
Marble and stone work.....	342	10,411	30.8	12,395,000	18.1	9,877,000	29.5	29.5	50.0	30.6	68.0
Lumber and timber products.....	593	4,700	14.2	8,598,000	12.6	4,467,000	13.3	-9.3	7.7	-7.3	13.8
Butter, cheese, and condensed milk.....	186	510	1.5	8,112,000	11.9	1,056,000	3.2				
Woolen, worsted, and felt goods, and wool hats.....	17	2,204	6.8	4,497,000	6.6	1,618,000	4.8	-4.3		-15.0	
Flour-mill and gristmill products.....	133	156	0.5	4,133,000	6.0	605,000	1.8	28.0	15.7	81.1	-30.8
Paper and wood pulp.....	25	1,030	3.0	3,902,000	5.7	1,447,000	4.3	1.0	13.2	12.1	-24.1
Foundry and machine-shop products.....	56	1,860	5.6	3,755,000	5.5	2,420,000	7.2	11.1	42.5	-0.7	61.3
Hosiery and knit goods.....	8	946	2.8	1,746,000	2.6	657,000	2.0	-12.2	8.4	-15.0	7.4
Furniture and refrigerators.....	10	1,119	3.3	1,618,000	2.4	915,000	2.7				
Patent medicines and compounds and druggists' preparations.....	15	161	0.5	1,290,000	1.9	704,000	2.1	-7.7	-34.2	-31.5	-28.3
Clothing, men's, including shirts.....	11	1,281	3.8	1,274,000	1.9	683,000	2.0	5.0		12.2	
Cars and general shop construction and repairs by steam-railroad companies.....	7	692	2.0	1,135,000	1.7	606,000	1.8	32.0	4.2	25.5	1.7
Printing and publishing.....	115	666	2.0	1,039,000	1.5	789,000	2.4	11.5	17.7	13.4	15.6
Bread and other bakery products.....	75	242	0.7	994,000	1.5	370,000	1.1	99.2	19.7	68.7	5.2
Cooperage and wooden goods, not elsewhere specified.....	25	635	1.9	693,000	1.0	453,000	1.4	55.7	178.1	53.6	183.7
Agricultural implements.....	11	360	1.1	582,000	0.9	310,000	0.9	31.7	10.5	10.2	26.2
Clothing, women's.....	6	333	1.0	503,000	0.7	218,000	0.7	-30.3	204.6	-28.8	259.0
Copper, tin, and sheet-iron products.....	19	149	0.4	425,000	0.6	220,000	0.7				
Confectionery.....	10	145	0.4	356,000	0.5	142,000	0.4	44.7	-0.8	20.1	-20.3
Canning and preserving.....	8	118	0.3	330,000	0.5	116,000	0.3	108.3	-40.6	93.3	-39.4
Gas, illuminating and heating.....	9	70	0.2	278,000	0.4	178,000	0.5	115.5	81.7	95.0	78.4
Line.....	11	135	0.5	250,000	0.4	181,000	0.4	-6.0			
Carrriages and wagons and materials.....	38	94	0.3	158,000	0.2	100,000	0.3	-3.7	-42.5	-8.3	-41.7
Tobacco manufactures.....	25	58	0.2	118,000	0.2	75,000	0.2	-7.1	47.7	-7.4	47.3
Brick and tile.....	7	70	0.2	65,000	0.1	51,000	0.2	-37.5	4.0	-38.0	1.2
Leather goods.....	3	14	( <sup>2</sup> )	28,000	( <sup>2</sup> )	14,000	( <sup>2</sup> )	-35.3	-29.1	-30.1	-17.9
All other industries.....	184	5,090	15.1	10,038,000	14.7	5,265,000	15.7				

<sup>1</sup> Percentages are based on figures in Table I, and a minus sign (-) denotes a decrease. Where percentages are omitted, the figures are not comparable.

<sup>2</sup> Less than one-tenth of 1 per cent.

It should be borne in mind, in considering this table, that the value of products in some of the industries involves a certain amount of duplication, due to the fact that the product of one establishment often becomes the material for another establishment.

The most important industries listed in this table, in which they are arranged in the order of the value of products, call for brief consideration.

*Marble and stone work.*—Vermont possesses a practically unlimited supply of two of the most useful kinds of stone, marble and granite, and for years has ranked first among the states in the output of marble. There was an increase of 113 in the number of establishments in this industry between 1904 and 1909. The average number of wage earners increased 28.6 per cent; the

value of products, 29.5 per cent; and the value added by manufacture, 30.6 per cent. To this industry alone are credited nearly one-third of the total average number of wage earners and nearly one-fifth of the total value of manufactured products for the state.

*Lumber and timber products.*—The lumber industry, which was one of the first manufacturing industries started in the state, continues relatively important. It embraces establishments engaged in logging operations, and sawmills, planing mills, and wooden packing-box factories. There was a decrease during the five-year period 1904-1909 of 9.3 per cent in value of products and 7.3 per cent in value added by manufacture.

*Butter, cheese, and condensed milk.*—This industry is very important in the state. To avoid disclosure of individual operations the statistics for one condensed-milk establishment were omitted in 1904, for which reason the percentages of increase for the industry are not given in the preceding table. From 1899 to 1909, however, the total value of products increased \$2,456,000, or 43.4 per cent, and the value added by manufacture, \$285,000, or 37 per cent. The decrease in number of establishments from 255 in 1899 to 186 in 1909 was due to the abandonment of small local creameries and the establishment of larger central plants.

*Textiles.*—The textile manufactures of the state, including woolen and worsted goods, hosiery and knit goods, and cotton goods, are important as a whole, although each branch of the industry showed a general decrease during the five-year period 1904–1909. The manufacture of woolen and worsted goods, which is by far the most important of the textile industries in Vermont, decreased 4.3 per cent in value of products and 15 per cent in value added by manufacture from 1904 to 1909. The hosiery and knit-goods industry decreased during this period 12.2 per cent in value of products and 15 per cent in value added by manufacture. The statistics for the three establishments engaged in the cotton-goods industry are omitted to avoid the disclosure of individual operations. No establishments were reported in the state as engaged primarily in making felt goods or wool hats and only one in manufacturing worsted goods.

*Flour-mill and gristmill products.*—This industry shows a steady growth during the decade. The industry is not very important, however, from the standpoint of the number of wage earners, giving employment to an average of only 156 persons. Owing to the comparatively simple processes involved and the extent to which these processes are carried on by machinery, the value added by manufacture is not commensurate with the gross value of products or the number of the establishments.

*Paper and wood pulp.*—The establishments which produce pulp as a final product, as well as those which manufacture paper or pulp and paper, are included under this classification. The industry has shown only small growth during the last five years.

The 13 leading industries measured by value of products hold a somewhat different rank when measured by value added by manufacture. Marble and stone work and the lumber industry continue to be the two most important industries of the state, but the foundry and machine-shop industry rises from seventh to third place. The woolen and worsted goods and the paper and wood-pulp industries both become of more importance than the manufacture of butter, cheese, and condensed milk, ranking fourth, fifth, and sixth, respectively. Furniture and refrigerators, printing and publishing, patent medicines, and men's clothing

take seventh, eighth, ninth, and tenth places, respectively, while the hosiery and knit goods industry drops from eighth to eleventh place. The car-repair shops of steam railroads hold the same position when measured by value added by manufacture as when measured by value of products. The flour-mill and gristmill industry falls from fifth to thirteenth place.

This table shows also the percentages of increase for these leading industries in respect to value of products and value added by manufacture where these statistics are comparable. Four of the 13 leading industries decreased from 1904 to 1909 in value of products and five in value added by manufacture. The flour-mill and gristmill industry showed a greater rate of increase from 1904 to 1909 in value added by manufacture than any other of these industries, namely, 81.1 per cent, while during the same period the steam-railroad repair shop industry showed the greatest rate of increase in value of products, 32 per cent.

In addition to the industries presented separately there are 19 other industries which had a value of products in 1909 in excess of \$100,000, but which are included in all other industries in the table. In the case of two of these industries—the manufacture of food preparations and the turning and carving of wood—the returns do not properly present the true condition of the industry, as it is more or less interwoven with one or more other industries of similar character. The other 17 industries are included under this head to avoid disclosing the operations of individual establishments. These industries are: Boots and shoes, including cut stock and findings; brushes; coffins, burial cases, and undertakers' goods; cotton goods, including cotton small wares; cutlery and tools, not elsewhere specified; dairymen's, poulterers', and apiarists' supplies; firearms and ammunition; furnishing goods, men's; grease and tallow; leather, tanned, curried, and finished; musical instruments, pianos and organs, and materials; paper goods, not elsewhere specified; photographic apparatus and materials; scales and balances; shoddy; toys and games; and window shades and fixtures. Statistics, however, for cutlery and tools, and musical instruments are shown in Table II for 1909.

*Persons engaged in manufacturing industries.*—The next table shows, for 1909, the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables is an estimate obtained by the method described in the Introduction.

The average number of persons engaged in manufactures during 1909 was 38,580, of whom 33,788 were wage earners. Of the remainder, 3,088 were proprietors and officials and 1,704 were clerks. Corresponding figures for individual industries will be found in Table II, page 18.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes.....	38,580	33,805	5,275
Proprietors and officials.....	3,088	3,013	75
Proprietors and firm members.....	2,113	2,053	60
Salaried officers of corporations.....	302	293	9
Superintendents and managers.....	673	667	6
Clerks.....	1,704	1,202	502
Wage earners (average number).....	33,788	29,000	4,008
16 years of age and over.....	33,577	28,946	4,031
Under 16 years of age.....	211	144	67

The following table shows, for 1909, the percentages of proprietors and officials, clerks, and wage earners, respectively, among the total number of persons employed in manufactures. It covers all industries combined and 13 important industries individually.

INDUSTRY.	PERSONS ENGAGED IN MANUFACTURES.			
	Total number.	Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
All industries.....	38,580	8.0	4.4	87.6
Butter, cheese, and condensed milk.....	690	20.0	4.0	74.2
Cars and general shop construction and repairs by steam-railroad companies.....	1,023	1.0	1.2	97.0
Clothing, men's, including shirts.....	1,369	2.1	3.7	94.3
Flour-mill and gristmill products.....	350	50.0	4.0	44.6
Foundry and machine-shop products.....	2,141	5.9	7.2	80.9
Furniture and refrigerators.....	1,226	3.0	4.8	91.3
Hosiery and knit goods.....	974	1.7	1.1	97.1
Lumber and timber products.....	5,720	14.7	1.5	83.7
Marble and stone work.....	11,545	0.5	3.4	90.2
Paper and wood pulp.....	1,133	5.8	3.3	90.0
Patent medicines and compounds and druggists' preparations.....	269	10.4	20.7	50.9
Printing and publishing.....	919	10.8	10.8	72.5
Woolen, worsted, and felt goods, and wool hats.....	2,371	1.4	1.8	96.8
All other industries.....	8,851	7.4	7.1	85.4

Of the total number of persons engaged in all manufacturing industries, 8 per cent were proprietors and officials, 4.4 per cent clerks, and 87.6 per cent wage earners. In the flour-mill and gristmill industry the majority of the establishments are small and the work is to a large extent done by the proprietors or their immediate representatives, so that the proportion of persons engaged in this industry falling in the class of proprietors and officials is very much higher than for other industries or for all industries combined. The percentage of proprietors and officials is also relatively high in the butter, cheese, and condensed milk, the lumber, and the printing and publishing industries, where the small establishment predominates.

The following table shows for 1909, in percentages, for all industries combined, the distribution of the average number of wage earners by age periods, and for those 16 years of age and over by sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries separately, a similar distribution of wage earners as reported for

December 15, or the nearest representative day. As a means of judging the importance of the several industries, the average total number employed for the year is also given in each case.

INDUSTRY.	Average number. <sup>1</sup>	WAGE EARNERS.		
		Per cent of total.		Under 16 years of age.
		16 years of age and over.	Male.	
All industries.....	33,788	85.7	13.7	0.6
Butter, cheese, and condensed milk.....	519	95.4	4.2	0.4
Cars and general shop construction and repairs by steam-railroad companies.....	902	100.0	.....	.....
Clothing, men's, including shirts.....	1,281	11.0	80.0	.....
Flour-mill and gristmill products.....	156	100.0	.....	.....
Foundry and machine-shop products.....	1,860	67.1	2.8	0.1
Furniture and refrigerators.....	1,119	98.6	0.1	1.3
Hosiery and knit goods.....	946	34.9	64.6	0.5
Lumber and timber products.....	4,790	98.2	1.4	0.4
Marble and stone work.....	10,411	90.8	( <sup>2</sup> )	0.2
Paper and wood pulp.....	1,030	93.0	7.0	.....
Patent medicines and compounds and druggists' preparations.....	181	44.1	55.9	.....
Printing and publishing.....	919	70.9	28.8	0.3
Woolen, worsted, and felt goods, and wool hats.....	2,294	60.9	37.0	1.4
All other industries.....	7,503	78.3	20.1	1.6

<sup>1</sup> For method of estimating the distribution, by sex and age periods, of the average number in all industries combined, see Introduction.

<sup>2</sup> Less than one-tenth of 1 per cent.

For all industries combined, 85.7 per cent of the average number of wage earners were males 16 years of age and over; 13.7 per cent females 16 years of age and over; and six-tenths of 1 per cent children under the age of 16. It will be noted that in three industries, the manufacture of men's clothing, hosiery and knit goods, and patent medicines and compounds, the women outnumbered the men. In the men's clothing industry nearly nine-tenths of the wage earners were women. The wage earners under 16 years of age in Vermont are employed principally in marble and stone work, and in the woolen, and the lumber industries.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904, it is necessary to use the classification employed at the earlier census. (See Introduction.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				Per cent of increase, 1904-1909.
	1909		1904		
	Number.	Per cent distribution.	Number.	Per cent distribution.	
Total.....	38,580	100.0	37,015	100.0	4.2
Proprietors and firm members.....	2,113	5.5	1,850	5.0	13.8
Salaried employees.....	2,679	6.9	2,053	5.5	30.5
Wage earners (average number).....	33,788	87.6	33,100	89.4	2.1

Comparable figures are not obtainable for 1899. The table shows a greater percentage of increase in the salaried employees than in the other two classes.

The following table shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over according to sex, for 1909, 1904, and 1899. The averages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Total.....	33,788	100.0	33,106	100.0	23,179	100.0
16 years of age and over..	33,577	99.4	32,890	99.3	27,927	99.1
Male.....	28,946	85.7	28,321	85.5	23,954	85.0
Female.....	4,631	13.7	4,569	13.8	3,973	14.1
Under 16 years of age....	211	0.6	216	0.7	252	0.9

This table indicates that for all industries combined there has not been much change in the proportions of

male and female wage earners 16 years of age and over. In 1909 males 16 years of age and over formed 85.7 per cent of all wage earners, as compared with 85.5 per cent in 1904 and 85 per cent in 1899.

**Wage earners employed by months.**—The following table gives the number of wage earners employed on the 15th of each month during the year 1909, for all industries combined, for the lumber and the marble and stone work industries, and for all other industries combined; it gives also the percentage which the number reported for each month is of the greatest number reported for any month. The wage earners for the lumber industry are divided in the table in such a manner as to show separately the number engaged in the mills and in the logging operations. In Table II, page 18, are shown, for practically all of the important industries in the state, the largest number and the smallest number of wage earners reported for any month. The figures are for the 15th day or the nearest representative day of the month.

MONTH.	NUMBER OF WAGE EARNERS.											
	All industries.		Lumber and timber products.						Marble and stone work.		All other industries.	
			Total.		In mills.		In logging operations.					
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January.....	33,013	95.2	5,113	93.6	3,304	70.0	1,809	91.5	0,746	87.1	18,154	93.0
February.....	33,710	97.2	5,234	95.9	3,424	73.5	1,810	91.5	10,031	89.7	18,445	94.5
March.....	34,287	98.8	5,252	99.2	3,903	85.0	1,289	95.2	10,447	93.4	18,658	95.1
April.....	34,288	98.9	5,047	92.4	4,582	98.3	465	23.5	10,783	96.4	18,458	94.0
May.....	34,317	99.0	5,089	93.2	4,061	100.0	428	21.6	10,908	97.5	18,320	93.9
June.....	34,134	98.4	4,088	85.9	4,242	91.0	440	22.5	11,006	98.4	18,440	94.5
July.....	32,875	94.8	3,085	73.0	3,550	79.3	429	21.7	11,182	99.9	17,708	90.8
August.....	33,359	96.2	3,806	70.8	3,382	72.6	484	24.5	11,180	100.0	18,307	93.8
September.....	34,098	98.3	4,200	76.0	3,504	75.2	696	35.2	11,117	99.4	18,781	96.3
October.....	34,392	99.2	4,535	83.1	3,625	75.6	1,010	51.1	10,860	97.1	18,997	97.4
November.....	34,677	100.0	5,020	91.0	3,424	73.5	1,596	80.7	10,294	92.0	19,803	99.2
December.....	32,342	93.3	5,460	100.0	3,482	74.7	1,978	100.0	7,872	65.0	19,510	100.0

The periods of maximum employment in the two important industries shown separately in the table occur at different seasons, and to a large extent the fluctuations in one industry balance those in the other. For this reason there is no great variation in the total number of wage earners for the different months of the year. The greatest activity in logging operations took place during the winter months, reaching the maximum in December. In the mills, however, the conditions were reversed, the greatest number of wage earners being reported for the spring and summer months. In the marble and stone work industry the number increased gradually from January to August, after which there was a decline to the end of the year, the small proportion shown for December being due to

labor troubles, and was sufficient to cause this month to show the minimum employment for all industries combined. The decrease from August to December was 34.1 per cent. For all industries combined the greatest number of wage earners were employed in November and the smallest number in December.

**Prevailing hours of labor.**—In the following table wage earners have been classified according to the hours of labor prevailing in the establishments in which they are employed. In making this classification the average number of wage earners employed during the year 1909 is used; and the number employed in each establishment is classified as a total, according to the hours prevailing in that establishment, even though a few employees work a greater or less number of hours.

## MANUFACTURES—VERMONT.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries.....	33,788	4,898	1,080	4,000	11,302	11,879	466	98	65
Agricultural implements.....	360			100	100	61			
Bread and other bakery products.....	242	12		45	4	154	3	19	5
Brick and tile.....	70			18	5	47			
Butter, cheese, and condensed milk.....	519	31	14	28	20	134	250	17	16
Canning and preserving.....	118					118			
Carriages and wagons and materials.....	94			15	21	58			
Cars and general shop construction and repairs by steam-railroad companies.....	902		170		804	10	8		
Clothing, men's, including shirts.....	1,281	278		3	948	52			
Clothing, women's.....	333				277	56			
Confectionery.....	145	1		3	48	93			
Cooperage and wooden goods, not elsewhere specified.....	635		23		54	558			
Copper, tin, and sheet-iron products.....	149		4	55	68	22			
Flour-mill and gristmill products.....	156	12	1	6	20	107	8	2	
Foundry and machine-shop products.....	1,800			881	719	200			
Furniture and refrigerators.....	1,119			127	428	564			
Gas, illuminating and heating.....	70	7		4	3	3	44		9
Hosiery and knit goods.....	946					940			
Lime.....	185			25		98	31		31
Lumber and timber products.....	4,790	35	5	285	1,024	3,384	57		
Marble and stone work.....	10,411	3,973	213	638	5,240	341			
Paper and wood pulp.....	1,030	268	415	35	203	51	58		
Patent medicines and compounds and druggists' preparations.....	161	1	31	105	15	9			
Printing and publishing.....	600	181	61	317	61	46			1
Tobacco manufactures.....	58	56				1			
Woolen, worsted, and felt goods, and wool hats.....	2,294		39		20	2,229			
All other industries.....	5,104	43	104	1,345	1,208	2,325	14	2	3

It is evident from these figures that for the great majority of wage earners employed in the manufacturing industries of Vermont the prevailing hours of labor range from 54 to 60 hours per week, only 17.7 per cent of the total being employed in establishments where the employees work less than 54 hours per week, and 1.9 per cent in establishments whose employees work more than 60 hours per week.

In the marble and stone work industry, in which nearly one-third of the total number of wage earners for the state are employed, the prevailing hours of labor are 48 hours per week and under for 38.2 per cent of the wage earners, between 54 and 60 hours per week for 50.4 per cent, and 60 hours per week (which is the maximum for the industry) for 3.3 per cent. The prevailing hours in the steam-railroad car repair shops and in establishments making men's and women's clothing are between 54 and 60 hours per week. In the bakery, canning and preserving, cooperage, flour and grist mill, hosiery, lumber, and woolen goods industries the prevailing hours of labor are 60 per week. In the furniture industry about one-half the wage earners work 60 hours per week, and the rest either 54 hours or between 54 and 60 hours; and in the butter and cheese industry a majority of the wage earners work over 60 hours per week.

**Location of establishments.**—The next table shows the extent to which the manufactures of Vermont are centralized in cities of 10,000 population or over. (See Introduction.) The statistics for 1904 are omitted from this table, because there was no Federal census of population for that year, and it was impossible

to determine the cities that come within the group having over 10,000 inhabitants.

ITEM.	Year.	Total.	LOCATION OF ESTABLISHMENTS.		PER CENT OF TOTAL.	
			In cities with population of 10,000 and over.	Outside districts.	In cities with population of 10,000 and over.	Outside districts.
Population.....	1910	355,056	44,748	311,208	12.6	87.4
	1900	343,641	30,139	313,502	8.8	91.2
Number of establishments.....	1900	1,058	284	1,674	14.5	85.5
	1899	1,938	139	1,799	7.2	92.8
Average number of wage earners.....	1900	33,788	6,347	27,441	18.8	81.2
	1899	28,170	3,728	24,451	13.2	86.8
Value of products.....	1900	\$68,300,824	\$13,332,195	\$54,977,629	19.5	80.5
	1899	51,515,228	8,025,240	43,489,988	15.6	84.4
Value added by manufacture.....	1900	33,487,096	6,693,974	26,793,122	20.0	80.0
	1899	25,130,416	3,895,818	21,234,598	15.5	84.5

In 1909, 19.5 per cent of the total value of products and 18.8 per cent of the average number of wage earners were reported from the three cities having over 10,000 inhabitants in 1910. The figures indicate that while little relative change took place during the 10 years in the amount of manufacturing done in cities of 10,000 and over and in districts outside, yet on the whole the manufactures of the cities have gained considerably on those of the districts outside. This is due to some extent to the increase in the population of Barre, which city had less than 10,000 inhabitants in 1900, and so was included in the districts outside in 1899.

The population for 1910 and 1900 of the three cities which had 10,000 inhabitants or over in 1910 is given in the following statement:

CITY.	1910	1900
Burlington.....	20,468	18,640
Rutland.....	13,546	11,499
Barre.....	10,734	8,448

The relative importance in manufactures of each of these three cities is shown in the following table, in which the average number of wage earners and the value of products are shown separately for 1909, 1904, and 1899:

CITY.	AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.		
	1909	1904	1899	1909	1904	1899
Burlington.....	2,371	2,300	2,232	\$6,800,490	\$6,355,754	\$6,066,184
Barre.....	2,340	2,198	1,875	3,852,177	3,373,040	2,790,852
Rutland.....	1,036	1,803	1,406	2,679,528	2,522,856	1,950,056

Each of the three cities shows an increase in value of products both from 1899 to 1904 and from 1904 to 1909. Burlington and Barre show increases in the average number of wage earners reported during each of the five-year periods, while Rutland shows a decrease in the average number of wage earners from 1904 to 1909.

The percentage of increase in value of products for Burlington was 4.8 per cent from 1899 to 1904 and 7 per cent from 1904 to 1909. The increase during the latter period was due principally to the establishment of a new furniture factory and an increase in the production of establishments manufacturing men's clothing, cotton goods, and photographic materials.

The value of products manufactured in Rutland increased but 6.2 per cent from 1904 to 1909, whereas the increase from 1899 to 1904 was 28.8 per cent. The leading industries in 1909 were the manufacture of scales and balances, the foundries and machine shops, and the steam-railroad car repair shops.

In 1909 and in 1904 the leading industry in Barre was marble and stone work, which in both years contributed about nine-tenths of the value of all its manufactured products. The marble and stone work produced in Barre in 1909 represented more than one-fourth of the total value of the products for this industry in the state.

**Character of ownership.**—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available. Figures for 1909 only are presented for several important industries individually. In order to avoid disclosing the operations of

individual concerns, it is necessary to omit several important industries from this table and the one following.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>				
1909.....	1,958	33,788	\$68,309,824	\$33,487,096
1904.....	1,699	33,106	68,083,611	30,653,759
<b>Individual:</b>				
1909.....	1,020	5,066	12,175,721	5,287,203
1904.....	833	5,882	12,027,326	5,844,338
<b>Firm:</b>				
1909.....	451	5,730	10,774,000	5,715,393
1904.....	440	6,516	12,047,420	6,248,376
<b>Corporation:</b>				
1909.....	372	22,857	42,641,046	22,240,692
1904.....	300	20,544	36,373,592	18,304,637
<b>Other:</b>				
1909.....	103	120	2,718,088	243,308
1904.....	108	104	2,635,273	196,408
<b>Per cent of total:</b>				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
<b>Individual:</b>				
1909.....	52.6	15.0	17.8	15.8
1904.....	49.0	17.8	19.1	19.1
<b>Firm:</b>				
1909.....	23.2	17.0	15.8	17.1
1904.....	26.4	19.7	19.1	20.4
<b>Corporation:</b>				
1909.....	19.0	67.0	62.4	66.4
1904.....	18.2	62.1	57.7	59.0
<b>Other:</b>				
1909.....	5.3	0.4	4.0	0.7
1904.....	6.4	0.5	4.2	0.6
<b>Butter, cheese, and condensed milk, 1909.....</b>	<b>186</b>	<b>519</b>	<b>\$8,112,239</b>	<b>\$1,056,425</b>
Individual.....	50	107	1,850,284	191,583
Firm.....	14	38	500,280	55,000
Corporation.....	22	245	2,053,037	572,785
Other.....	100	129	2,711,738	230,058
<b>Per cent of total.....</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Individual.....	26.0	20.0	22.8	18.1
Firm.....	7.5	7.3	7.4	5.3
Corporation.....	11.8	47.2	30.4	54.2
Other.....	53.8	24.9	33.4	22.3
<b>Flour-mill and gristmill products, 1909.....</b>	<b>133</b>	<b>156</b>	<b>\$4,133,337</b>	<b>\$605,015</b>
Individual.....	92	91	1,040,353	275,223
Firm.....	33	30	1,338,550	110,758
Corporation.....	8	26	848,425	210,034
<b>Per cent of total.....</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Individual.....	60.2	58.3	47.1	45.5
Firm.....	24.8	25.0	32.4	18.3
Corporation.....	6.0	16.7	20.5	36.2
<b>Foundry and machine-shop products, 1909.....</b>	<b>56</b>	<b>1,860</b>	<b>\$3,754,801</b>	<b>\$2,419,690</b>
Individual.....	20	184	350,850	223,634
Firm.....	11	141	241,804	136,505
Corporation.....	25	1,535	3,102,057	2,059,461
<b>Per cent of total.....</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Individual.....	35.7	9.0	9.3	6.2
Firm.....	19.6	7.6	6.4	5.6
Corporation.....	44.6	82.5	84.2	85.1
<b>Furniture and refrigerators, 1909.....</b>	<b>19</b>	<b>1,119</b>	<b>\$1,617,759</b>	<b>\$914,492</b>
Firm.....	5	29	36,305	26,445
Corporation.....	14	1,090	1,581,304	888,047
<b>Per cent of total.....</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Firm.....	26.3	2.0	2.2	2.0
Corporation.....	73.7	97.4	97.8	97.1
<b>Lumber and timber products, 1909.....</b>	<b>593</b>	<b>4,790</b>	<b>\$8,598,084</b>	<b>\$4,467,342</b>
Individual.....	390	1,092	3,154,198	1,800,055
Firm.....	142	1,492	2,100,641	1,357,709
Corporation.....	61	1,426	3,273,245	1,309,591
<b>Per cent of total.....</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Individual.....	65.8	41.0	36.8	40.3
Firm.....	23.9	29.3	25.1	30.4
Corporation.....	10.3	29.8	38.1	29.3
<b>Marble and stone work, 1909.....</b>	<b>342</b>	<b>10,411</b>	<b>\$12,995,979</b>	<b>\$9,877,531</b>
Individual.....	130	1,030	1,520,143	1,067,110
Firm.....	132	2,093	3,407,108	2,777,183
Corporation.....	61	6,388	7,178,038	6,003,220
<b>Per cent of total.....</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Individual.....	39.8	9.9	12.3	11.1
Firm.....	44.4	28.7	26.8	28.1
Corporation.....	15.8	61.4	67.9	60.8

\* Includes the group "Individual" to avoid disclosure of individual operations.

The most important distinction shown is that between corporate and all other forms of ownership. For all industries combined, 19 per cent of the total number of establishments were in 1909 under corporate ownership, as against 81 per cent under all other forms. The corresponding figures for 1904 were 18.2 per cent and 81.8 per cent, respectively. In the other three items shown in this table the totals for establishments operated by corporations show a decided increase. Decreases are shown in the proportions of the total number of wage earners, value of products, and value added by manufacture reported by establishments under individual and firm ownership and the forms of ownership included under the head of "Other," except that the establishments under "Other" forms of ownership report a slightly larger proportion of the total value added by manufacture.

The forms of ownership prevailing in the different industries varied considerably. Unlike other important industries, the largest percentage of the marble

and stone works were owned by firms, only 15.8 per cent being under corporate ownership. In the butter, cheese, and condensed-milk industry the most common form of ownership was the cooperative, classed under "Other" forms of ownership in the table. These cooperative establishments are operated largely by farmers who have organized for the purpose of securing steadier and better markets for their milk.

Size of establishment.—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it the following table groups the establishments according to the value of their products. The table shows also the average size of establishments for all industries combined and for important industries separately as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the last two censuses, while for certain important industries figures are given for 1909 only.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
<b>ALL INDUSTRIES:</b>					<b>Flour-mill and gristmill products, 1909—Continued.</b>				
1909.....	1,958	33,788	\$68,309,824	\$33,487,096	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	1,699	33,106	63,083,611	30,653,759	Less than \$5,000.....	4.5	2.6	0.8	1.2
Less than \$5,000:					\$5,000 and less than \$20,000.....	55.6	32.1	22.5	24.4
1909.....	690	1,100	1,693,585	1,089,581	\$20,000 and less than \$100,000.....	36.1	51.3	44.8	43.4
1904.....	426	752	1,190,017	743,470	\$100,000 and less than \$1,000,000.....	3.8	14.1	31.9	31.0
\$5,000 and less than \$20,000:					Average per establishment.....		1	\$31,078	\$4,549
1909.....	644	3,844	6,976,450	3,729,572	<b>Foundry and machine-shop products, 1909.....</b>	56	1,860	\$3,754,801	\$2,419,090
1904.....	672	4,246	7,031,382	3,850,847	Less than \$5,000.....	11	25	27,302	15,910
\$20,000 and less than \$100,000:					\$5,000 and less than \$20,000.....	14	83	155,775	91,954
1909.....	493	9,491	20,346,258	9,653,436	\$20,000 and less than \$100,000.....	21	488	874,592	577,742
1904.....	483	10,011	19,927,286	9,145,201	\$100,000 and less than \$1,000,000.....	10	1,264	2,697,132	1,734,075
\$100,000 and less than \$1,000,000:					Per cent of total.....	100.0	100.0	100.0	100.0
1909.....	127	14,466	32,104,250	14,813,124	Less than \$5,000.....	19.6	1.3	0.7	0.7
1904.....	112	13,174	20,450,807	11,269,933	\$5,000 and less than \$20,000.....	25.0	4.5	4.1	3.8
\$1,000,000 and over:					\$20,000 and less than \$100,000.....	37.5	26.2	23.3	23.9
1909.....	4	4,887	7,195,281	4,201,383	\$100,000 and less than \$1,000,000.....	17.9	68.0	71.8	71.7
1904.....	6	4,023	8,475,050	5,644,298	Average per establishment.....		33	\$67,050	\$43,209
Per cent of total:					<b>Furniture and refrigerators, 1909.....</b>	19	1,119	\$1,017,759	\$914,482
1909.....	100.0	100.0	100.0	100.0	Less than \$5,000.....	3	11	9,865	8,039
1904.....	100.0	100.0	100.0	100.0	\$5,000 and less than \$20,000.....	3	27	37,175	25,581
Less than \$5,000:					\$20,000 and less than \$100,000.....	6	206	338,029	184,696
1909.....	35.2	3.3	2.5	3.3	\$100,000 and less than \$1,000,000.....	7	875	1,232,000	600,176
1904.....	25.1	2.3	1.9	2.4	Per cent of total.....	100.0	100.0	100.0	100.0
\$5,000 and less than \$20,000:					Less than \$5,000.....	15.8	1.0	0.6	0.9
1909.....	32.9	11.4	10.2	11.1	\$5,000 and less than \$20,000.....	15.8	2.4	2.3	2.8
1904.....	39.6	12.8	11.1	12.6	\$20,000 and less than \$100,000.....	31.6	18.4	20.0	20.2
\$20,000 and less than \$100,000:					\$100,000 and less than \$1,000,000.....	36.8	78.2	76.2	76.1
1909.....	25.2	28.1	29.8	28.8	Average per establishment.....		59	\$85,145	\$18,131
1904.....	28.4	30.2	31.6	29.8	<b>Lumber and timber products, 1909.....</b>	593	4,790	\$8,598,084	\$4,467,342
\$100,000 and less than \$1,000,000:					Less than \$5,000.....	304	578	749,081	502,946
1909.....	6.5	42.8	47.0	44.2	\$5,000 and less than \$20,000.....	214	1,624	2,227,094	1,463,365
1904.....	6.6	39.8	41.9	36.8	\$20,000 and less than \$100,000.....	66	1,652	2,463,711	1,693,905
\$1,000,000 and over:					\$100,000 and less than \$1,000,000.....	9	936	2,958,198	807,126
1909.....	0.2	14.5	10.5	12.5	Per cent of total.....	100.0	100.0	100.0	100.0
1904.....	0.4	14.9	13.4	18.4	Less than \$5,000.....	51.3	12.1	8.7	11.3
Average per establishment:					\$5,000 and less than \$20,000.....	36.1	33.9	25.0	32.8
1909.....		17	\$34,888	\$17,103	\$20,000 and less than \$100,000.....	11.1	34.5	31.0	37.9
1904.....		19	37,130	18,012	\$100,000 and less than \$1,000,000.....	1.5	19.5	34.4	18.1
<b>Butter, cheese, and condensed milk, 1909.....</b>	186	519	\$5,112,339	\$1,056,425	Average per establishment.....		8	\$14,499	\$7,533
Less than \$5,000.....	15	9	59,363	9,030	<b>Marble and stone work, 1909 ..</b>	342	10,411	\$12,395,379	\$9,877,531
\$5,000 and less than \$20,000.....	56	49	688,974	73,438	Less than \$5,000.....	97	144	252,574	182,150
\$20,000 and less than \$100,000.....	103	292	4,146,968	410,307	\$5,000 and less than \$20,000.....	111	986	1,209,630	963,126
\$100,000 and less than \$1,000,000.....	12	259	3,225,934	557,650	\$20,000 and less than \$100,000.....	115	3,448	4,434,976	3,215,534
Per cent of total.....	100.0	100.0	100.0	100.0	\$100,000 and less than \$1,000,000 <sup>1</sup> .....	19	5,833	6,408,199	5,576,721
Less than \$5,000.....	8.1	1.7	0.6	0.9	Per cent of total.....	100.0	100.0	100.0	100.0
\$5,000 and less than \$20,000.....	30.1	9.4	8.5	7.9	Less than \$5,000.....	28.4	1.4	2.0	1.8
\$20,000 and less than \$100,000.....	55.4	38.9	51.1	39.4	\$5,000 and less than \$20,000.....	32.5	9.5	9.8	9.1
\$100,000 and less than \$1,000,000.....	0.5	40.9	39.8	52.8	\$20,000 and less than \$100,000.....	33.6	33.1	35.8	32.6
Average per establishment.....		3	\$43,614	\$5,680	\$100,000 and less than \$1,000,000 <sup>1</sup> .....	5.6	56.0	52.4	56.5
<b>Flour-mill and gristmill products, 1909.....</b>	133	156	\$4,133,337	\$605,015	Average per establishment.....		30	\$36,244	\$28,352
Less than \$5,000.....	0	4	34,734	7,130	<b>Marble and stone work, 1909 ..</b>	342	10,411	\$12,395,379	\$9,877,531
\$5,000 and less than \$20,000.....	74	50	931,558	147,696	Less than \$5,000.....	97	144	252,574	182,150
\$20,000 and less than \$100,000.....	48	80	1,849,723	292,826	\$5,000 and less than \$20,000.....	111	986	1,209,630	963,126
\$100,000 and less than \$1,000,000.....	5	22	1,317,322	187,363	\$20,000 and less than \$100,000.....	115	3,448	4,434,976	3,215,534
					\$100,000 and less than \$1,000,000 <sup>1</sup> .....	19	5,833	6,408,199	5,576,721

<sup>1</sup> Includes the group "\$1,000,000 and over."

MANUFACTURES—VERMONT.

This table shows that, in 1909, of the 1,958 manufacturing establishments in the state, 131, or 6.7 per cent, had a value of products exceeding \$100,000. These establishments, however, employed an average of 19,353 wage earners, or 57.3 per cent of the total number in all establishments, and reported 57.5 per cent of the total value of products, and 56.7 per cent of the total value added by manufacture.

On the other hand, the very small establishments—that is, those having a value of products of less than \$5,000—constituted a considerable proportion (35.2 per cent) of the total number of establishments, but the value of their products amounted to only 2.5 per cent of the total. The bulk of the manufacturing was reported by establishments having a product valued at not less than \$100,000.

It will be seen from the above table that during the five years from 1904 to 1909 there was a considerable increase as measured by value of products in the relative importance of the establishments

having a value of products between \$100,000 and \$1,000,000.

The decrease in the average value of products per establishment from \$37,130 to \$34,888, and in value added by manufacture from \$18,042 to \$17,103, during the five-year period, is due to the large increase in the number of small establishments—those reporting a product valued at less than \$5,000. There was also a decrease from 19 to 17 in the average number of wage earners per establishment.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The next table shows, for 1909, such a classification for all industries combined and for 13 important industries individually, and gives not only the number of establishments falling in each group, but also the average number of wage earners employed.

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All Industries.....	1,958	131	1,100	414	198	57	39	16	1	2
Butter, cheese, and condensed milk.....	180	4	169	7	5	1	1	2		
Cars and general shop construction and repairs by steam-railroad companies.....	7			2	1	1	1	2		
Clothing, men's, including shirts.....	11		1	1	2	2	3	2		
Flour-mill and gristmill products.....	133	27	103	3						
Foundry and machine-shop products.....	56	1	17	15	12	5	5	1		
Furniture and refrigerators.....	10		2	0	3	3	5			
Hosiery and knit goods.....	8		1		2	3	1	1		
Lumber and timber products.....	593	10	386	149	30	4	5			1
Marble and stone work.....	342	22	119	104	70	13	0	4		1
Paper and wood pulp.....	25		1	0	0	5		1		
Patent medicines and compounds and druggists' preparations.....	15	3	7	3	1	1		1		
Printing and publishing.....	115	18	62	27	8					
Woolen, worsted, and felt goods, and wool hats.....	17	1		0	6	7	2			1
All other industries.....	431	45	232	88	40	12	8	5	1	
AVERAGE NUMBER OF WAGE EARNERS.										
All Industries.....	33,788		2,348	4,677	6,388	3,955	5,955	5,897	794	3,776
Butter, cheese, and condensed milk.....	519		246	52	150	71	656	589		
Cars and general shop construction and repairs by steam-railroad companies.....	802			18	24	68	102	780		
Clothing, men's, including shirts.....	1,281		3	14	72	105	523	504		
Flour-mill and gristmill products.....	150		138	18						
Foundry and machine-shop products.....	1,800		44	138	336	337	700	290		
Furniture and refrigerators.....	1,119		3	69	112	225	710			
Hosiery and knit goods.....	946		5		70	213	151	498		
Lumber and timber products.....	4,790		912	1,047	1,250	275	706			
Marble and stone work.....	10,411		207	1,328	2,320	941	1,402	1,621		2,502
Paper and wood pulp.....	1,030		5	122	204	292		317		
Patent medicines and compounds and druggists' preparations.....	161		14	26	22	06				
Printing and publishing.....	606		157	257	252					
Woolen, worsted, and felt goods, and wool hats.....	2,294				193	488	344			1,274
All other industries.....	7,563		522	988	1,284	846	1,308	1,821	794	
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All Industries.....	100.0		6.9	13.8	18.9	11.7	17.6	17.5	2.3	11.2
Butter, cheese, and condensed milk.....	100.0		47.4	10.0	28.9	13.7				
Cars and general shop construction and repairs by steam-railroad companies.....	100.0			1.8	2.4	6.0	10.3	78.6		
Clothing, men's, including shirts.....	100.0		0.2	1.1	5.6	8.2	40.8	44.0		
Flour-mill and gristmill products.....	100.0		88.5	11.5						
Foundry and machine-shop products.....	100.0		2.4	7.4	18.1	18.1	38.1	15.9		
Furniture and refrigerators.....	100.0		0.3	6.2	10.0	20.1	63.4			
Hosiery and knit goods.....	100.0		0.5		8.4	22.5	10.0	52.6		
Lumber and timber products.....	100.0		19.0	34.4	26.1	5.7	14.7			
Marble and stone work.....	100.0		2.0	12.8	22.3	9.0	13.5	15.6		24.0
Paper and wood pulp.....	100.0		0.5	11.8	28.5	28.3		30.8		
Patent medicines and compounds and druggists' preparations.....	100.0		8.7	10.1	13.7	61.5				
Printing and publishing.....	100.0		23.6	38.6	37.8					
Woolen, worsted, and felt goods, and wool hats.....	100.0				8.4	21.1	15.0			55.5
All other industries.....	100.0		6.9	13.1	17.0	11.2	17.3	24.1	10.5	

Of the 1,958 establishments reported for all industries, 6.7 per cent employed no wage earners; 56.2 per cent, from 1 to 5; 21.1 per cent, 6 to 20; 10.1 per cent, 21 to 50; and 5.9 per cent, over 50. The most numerous single group consists of the 1,100 establishments employing from 1 to 5 wage earners each, and the next of the 414 establishments employing from 6 to 20 wage earners each. There were 19 establishments that employed over 250 wage earners each; two of these, one a marble yard and the other a woolen mill, employed over 1,000 wage earners each.

Of the total number of wage earners, 48.6 per cent were in establishments employing over 100 wage earners each. No one of the groups in the table greatly predominates. The single group having the largest number of wage earners is the group comprising the establishments employing from 21 to 50 wage earners each, although the two groups of establishments employing from 101 to 250 wage earners and from 251 to 500 wage earners, respectively, had each nearly as large a percentage of the total.

**Expenses.**—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses which make up the total.

The following table shows, for 1909, in percentages, the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II, page 18.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries .....	4.7	28.9	58.2	8.3
Butter, cheese, and condensed milk.....	0.0	3.8	92.6	3.0
Cars and general shop construction and repairs by steam-railroad companies.....	2.8	48.2	46.6	2.4
Clothing, men's, including shirts.....	7.3	35.4	51.8	5.5
Flour-mill and gristmill products.....	0.7	2.1	95.9	1.3
Foundry and machine-shop products.....	9.0	35.2	43.3	12.0
Furniture and refrigerators.....	8.1	34.1	48.1	0.6
Hosiery and knit goods.....	2.7	24.8	65.9	6.6
Lumber and timber products.....	2.7	27.0	57.2	12.1
Marble and stone work.....	6.0	62.0	24.4	7.7
Paper and wood pulp.....	4.1	17.1	70.9	7.9
Patent medicines and compounds and druggists' preparations.....	10.1	6.2	54.2	29.5
Printing and publishing.....	14.8	38.3	29.4	17.5
Woolen, worsted, and felt goods, and wool hats.....	2.0	24.1	66.5	7.3
All other industries.....	6.0	27.4	56.0	0.7

This table shows that, for all industries combined, 58.2 per cent of the total expense was incurred for materials, 33.6 per cent for services—that is, salaries and wages—and but 8.3 per cent for other purposes. As would be expected, the proportions vary greatly in the different industries.

**Engines and power.**—The following table shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows

separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 <sup>1</sup>	1909	1904	1899 <sup>1</sup>	1909	1904	1899
Primary power, total.....	3,258	2,217	2,321	159,445	140,618	126,124	100.0	100.0	100.0
Owned.....	2,410	2,217	2,321	145,880	134,745	122,900	91.5	95.8	97.5
Steam.....	1,167	900	1,017	64,252	56,833	44,100	40.3	40.4	35.0
Gas.....	161	101	77	2,160	1,483	1,120	1.4	1.1	0.9
Water wheels.....	1,053	1,078	1,227	78,881	76,044	77,421	49.5	54.1	61.4
Water motors.....	35	42	(*)	181	193	(*)	0.1	0.1	(*)
Other.....				415	102	265	0.3	0.1	0.2
Rented.....	840	(*)	(*)	13,556	5,871	3,128	8.5	4.2	2.5
Electric.....	840	(*)	(*)	12,917	4,550	1,444	8.1	3.2	1.1
Other.....				639	1,321	1,684	0.4	0.9	1.3
Electric motors.....	1,512	110	24	21,233	7,238	2,173	100.0	100.0	100.0
Run by current generated by establishment.....	672	110	24	8,316	2,688	729	39.2	37.1	33.5
Run by rented power.....	840	(*)	(*)	12,917	4,550	1,444	60.8	62.9	66.5

<sup>1</sup> Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.  
<sup>2</sup> Not reported.

This table shows an increase in primary power of 18,829 horsepower, or 13.4 per cent, from 1904 to 1909. Owned power increased 11,144 horsepower, of which 66.6 per cent was in steam power and 25.5 per cent in power derived from water wheels. The figures show that the practice of renting power is on the increase, 8.5 per cent of the total power being rented in 1909, as compared with 4.2 per cent in 1904 and 2.5 per cent in 1899. The use of electric motors for the purpose of applying the power generated within the establishments is also shown to be rapidly increasing, the number of such motors having increased from 24 in 1899 to 110 in 1904 and 672 in 1909, and their horsepower increasing from 729 in 1899 to 2,688 in 1904 and 8,316 in 1909.

**Fuel.**—Closely related to the question of the kind of power employed is that of the fuel consumed in generating this power, or otherwise used as material in the manufacturing processes. The following table shows the quantity of each kind of fuel used in 1909:

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gasoline (barrels).	Gas (1,000 feet).
All industries <sup>1</sup> .....	23,831	240,238	5,343	48,302	18,558	44,395
Agricultural implements.....	1,126	2,651		225	1,671	32,000
Butter, cheese, and condensed milk.....	3,780	6,380		7,138	167	
Cars and general shop construction and repairs by steam-railroad companies.....		7,794	216	152		
Clothing, men's, including shirts.....	820	361	2	45	1	400
Flour-mill and gristmill products.....	105	351		153	555	3,274
Foundry and machine-shop products.....	1,222	9,001	1,636	300	374	497
Furniture and refrigerators.....	5	2,780		30	40	
Gas, illuminating and heating.....	2,215	7,417	50	95	11,918	
Hosiery and knit goods.....	1,446	3,413		7		17
Lime.....		3,126		23,035	2	
Lumber and timber products.....	510	1,208		807	388	118
Marble and stone work.....	879	82,166	11	1,213	376	820
Paper and wood pulp.....	4,136	51,642		4,711		
Patent medicines and compounds and druggists' preparations.....	95	946		84	2	
Printing and publishing.....	577	80	1	207	67	3,012
Woolen, worsted, and felt goods, and wool hats.....		35,788	480	2,175		
All other industries.....	6,715	25,044	2,947	7,175	2,988	4,257

<sup>1</sup> In addition there were 202 tons of other varieties of fuel reported.

SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

(With statistics for laundries and custom sawmills and gristmills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and cost of materials and the quantity and value of products and other information, for securing which no provision is made on the general schedule. Certain data of this character for three important industries in Vermont are here presented.

**Lumber and timber products.**—With the exception of the marble and stone work industry, the lumber industry in Vermont is the most important one in the state, whether measured by average number of wage earners, value of products, or value added by manufacture, while in number of establishments it ranks first. The quantity of lumber, lath, and shingles produced in the sawmill branch of this industry in 1909 and 1899 is shown in the following statement:

PRODUCT.	QUANTITY.	
	1909	1899
Rough lumber..... M feet b. m. . . . .	351,571	375,809
Shingles..... thousands..	24,001	52,809
Lath..... thousands..	7,240	9,314

The returns for 1909, as compared with 1899, show decreases of 6.4 per cent in the output of lumber, 22.2 per cent in that of lath, and 54.6 per cent in that of shingles. The principal kinds of lumber produced are spruce, hemlock, white pine, and birch. In 1909, of the total cut of 351,571 M feet board measure, the softwoods represented 242,930 M feet board measure, of which spruce constitutes 123,164 M feet, hemlock 62,345 M feet, and white pine 43,274 M feet. Of the 108,641 M feet of hardwoods, birch represented 33,450 M feet, maple 27,533 M feet, and oak 11,463 M feet board measure.

**Butter, cheese, and condensed milk.**—Vermont is one of the leading dairy-product states, ranking ninth in respect to number of establishments and tenth in value of products. The quantity and value of products of the butter, cheese, and condensed milk industry for 1909, 1904, and 1899 are given in the next table.

The value of products for this industry shows an increase both from 1904 to 1909 and from 1899 to 1904. The total value of butter, packed solid and in prints and rolls, represented 74.2 per cent of the

total value of products of the industry in 1909, 91.1 per cent in 1904, and 83.3 per cent in 1899. From 1899 to 1904 there was an increase both in the total quantity and in the total value of butter produced, while from 1904 to 1909 there was an increase in value notwithstanding a marked decrease in quantity. In 1899, 22.7 per cent of the butter produced was put up in prints and rolls, and in 1909 37.8 per cent. A number of the factories purchased cream at their "central stations" for resale, using only a part of it for manufacturing purposes, because it is often more profitable to dispose of it as cream.

In the manufacture of cheese, there was between 1904 and 1909 a decrease of 36.4 per cent in quantity and of 7.4 per cent in value. The quantity and value of condensed milk produced in 1909, however, was about seven times that reported in 1899. The increasing custom of the farmers to separate the cream on the farm instead of sending the whole milk to the factory is apparent, since only 123 cream separators were reported as operated by factories in 1909, compared with 307 in 1904 and 382 in 1899.

PRODUCT.	1909	1904 <sup>1</sup>	1899
<b>Total value</b> .....	<b>\$8,112,239</b>	<b>\$6,416,434</b>	<b>\$5,650,265</b>
<b>Butter:</b>			
Packed solid—			
Pounds.....	12,589,015	16,219,831	17,366,750
Value.....	\$3,073,807	\$3,469,092	\$3,611,005
Prints or rolls—			
Pounds.....	7,638,480	11,046,043	5,086,631
Value.....	\$2,348,250	\$2,435,052	\$1,161,220
Cream sold:			
Pounds.....	4,592,709	571,402	215,830
Value.....	\$600,393	\$65,522	\$152,200
All other butter-factory products, value.	\$103,598	\$73,089	\$152,098
<b>Cheese:</b>			
Full cream—			
Pounds.....	2,576,073	4,271,169	4,008,063
Value.....	\$378,057	\$416,786	\$400,764
Other kinds—			
Pounds.....	180,583	72,000	645,042
Value.....	\$17,721	\$10,800	\$60,814
All other cheese-factory products, value..	\$14,741	\$6,063	\$9,460
<b>Condensed milk:</b>			
Sweetened—			
Pounds.....	9,006,582	(2)	<sup>a</sup> 1,073,550
Value.....	\$609,325	(2)	<sup>a</sup> \$135,720
Unsweetened—			
Pounds.....	4,240,084	(2)	.....
Value.....	\$306,338	(2)	.....
All other condensed-milk factory products, value.....	.....	.....	\$20,000

<sup>1</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.

<sup>2</sup> Figures can not be shown without disclosing individual operations.

<sup>a</sup> No separation made in 1899 of sweetened and unsweetened condensed milk.

**Flour-mill and gristmill products.**—The following tabular statement gives the quantity and value of flour-mill and gristmill products for the last three census years:

PRODUCT.	1909	1904	1899
<b>Total value</b> .....	<b>\$4,133,337</b>	<b>\$3,206,075</b>	<b>\$2,769,648</b>
Wheat flour:			
White—			
Barrels.....	90	2,007	3,009
Value.....	\$540	\$10,240	\$15,358
Graham—			
Barrels.....	79	1,019	.....
Value.....	\$474	\$4,424	.....
Corn meal and corn flour:			
Barrels.....	853,051	909,760	808,893
Value.....	\$2,511,964	\$2,106,276	\$1,852,701
Rye flour:			
Barrels.....	404	365	1,150
Value.....	\$1,406	\$1,504	\$4,111
Buckwheat flour:			
Pounds.....	303,550	106,350	529,394
Value.....	\$9,370	\$5,825	\$12,813
Feed:			
Tons.....	48,850	40,461	36,722
Value.....	\$1,528,928	\$1,032,712	\$701,685
Offal:			
Tons.....	12	168	4,850
Value.....	\$433	\$3,380	\$70,251
All other products, value.....	\$80,210	\$38,624	\$22,660

There was an increase of 28.9 per cent in the total value of products between 1904 and 1909. This was due chiefly to the increase shown for corn meal and corn flour, amounting to \$402,688, or 19.1 per cent, and for feed, amounting to \$496,216, or 48 per cent. The amount of wheat and rye milled in the state is insignificant. Barley meal, of which a considerable quantity is manufactured in Vermont, is included under the head of "All other products."

**Woolen and worsted goods.**—From 1904 to 1909 there was a decrease in this industry in Vermont, due to the falling off in the manufacture of woolen goods. Similar conditions prevailed in most other textile manufacturing states in the Union, but the loss in woolen goods was overcome by the increase in the production of worsted goods. The quantity and cost of the different materials used, and the quantity and value of the various classes of products, reported at the censuses of 1909, 1904, and 1899, are given in the statement following.

Although the cost of all materials, the quantity and cost of yarns purchased, and the cost of fuel and rent of power increased, all other items decreased from 1904 to 1909, while during the preceding five-year period every item of materials increased. The cost of yarns purchased was the largest item of materials used in 1909, constituting 37.6 per cent of the total cost of all materials, whereas the cost of wool was the largest in 1904 and in 1899. This condition indicates a change of methods in the industry.

With the exception of minor increases in the value of all-wool woven goods and the value of the articles included under the head, "All other products," each item of products decreased from 1904 to 1909, while every item except "All other products" increased

from 1899 to 1904. All-wool woven goods was the largest class of products at each of the three censuses, the value of which represented 64.5 per cent of the total reported for the industry in 1909, 58.3 per cent in 1904, and 65.4 per cent in 1899.

A total of 51,404 producing spindles were reported by the woolen and worsted mills of Vermont in 1909, compared with 50,738 in 1904 and 37,460 in 1899. The total number of looms used in the same class of establishments was 1,297 in 1909, 965 in 1904, and 775 in 1899.

MATERIAL OR PRODUCT.	1909	1904	1899 <sup>1</sup>
<b>Materials used, total cost</b> .....	<b>\$2,879,001</b>	<b>\$2,794,111</b>	<b>\$1,554,525</b>
Wool (in condition purchased):			
Pounds.....	1,620,956	3,264,133	3,170,502
Cost.....	\$977,308	\$973,988	\$814,806
Equivalent in scoured condition, pounds.....	1,165,432	2,004,874	2,173,044
Tailors' clippings, rags, etc.:			
Pounds.....	1,823,286	2,120,824	1,325,120
Cost.....	\$140,386	\$220,900	\$181,888
Shoddy; mungo and wool extract:			
Pounds.....	824,250	901,608	822,060
Cost.....	\$120,774	\$153,345	\$108,043
Cotton:			
Pounds.....	184,054	1,057,280	342,273
Cost.....	\$30,230	\$135,705	\$54,418
Yarns purchased:			
Pounds.....	1,805,180	1,316,052	220,286
Cost.....	\$1,083,028	\$303,872	\$52,075
Chemicals and dyestuffs, cost.....	\$161,175	\$172,971	\$101,201
Fuel and rent of power, cost.....	\$145,331	\$115,337	\$48,024
All other materials, cost.....	\$20,760	\$68,003	\$162,180
<b>Products, total value</b> .....	<b>\$4,496,808</b>	<b>\$4,698,405</b>	<b>\$2,878,648</b>
All-wool woven goods:			
Square yards.....	4,744,694	4,836,185	3,088,469
Value.....	\$2,809,133	\$2,738,140	\$1,682,051
Cotton-mixed woven goods:			
Square yards.....	2,273,010	2,727,203	2,310,100
Value.....	\$535,064	\$819,784	\$510,088
Cotton-warp woven goods:			
Square yards.....	2,076,701	3,376,997	1,139,233
Value.....	\$900,382	\$1,131,045	\$348,434
All other products, value.....	\$65,724	\$8,836	\$21,273

<sup>1</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.

**Laundries.**—Statistics for steam laundries are not included in the general tables or in the totals for manufacturing industries. In 1909 there were 32 such establishments distributed through the state of Vermont, only 7 being in cities of 10,000 inhabitants and over.

The following statement summarizes the statistics:

Number of establishments.....	32
Persons engaged in the industry.....	342
Proprietors and firm members.....	37
Salaried employees.....	6
Wage earners (average number).....	299
Primary horsepower.....	349
Capital.....	\$144,393
Expenses.....	155,436
Services.....	104,760
Materials.....	32,217
Miscellaneous.....	18,450
Amount received for work done.....	243,753

The most common form of organization was the individual, for which 27 establishments were reported, the other 5 being operated by firms. Fourteen had receipts for the year's business of less than \$5,000; 17, \$5,000 but less than \$20,000; and 1, over \$20,000.

The number of wage earners employed each month and the per cent which this number represented of the greatest number employed in any month were as follows:

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	274	81.3	July.....	337	100.0
February.....	269	79.8	August.....	331	98.2
March.....	270	80.1	September.....	313	92.9
April.....	285	84.6	October.....	309	91.7
May.....	296	87.8	November.....	290	86.1
June.....	315	93.5	December.....	295	87.5

The different kinds of primary power, the number of engines or motors, and the horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines or motors.	Horsepower.
<b>Primary power, total.....</b>		<b>349</b>
<b>Owned:</b>		
Steam.....	25	263
Gas.....	2	11
Water wheels.....	1	20
Water motors.....	1	2
<b>Rented:</b>		
Electric.....	10	43
Other.....		10

The kind and amount of fuel used are shown in the following statement:

KIND.	Unit.	Quantity.
Anthracite coal.....	Tons.....	313
Bituminous coal.....	Tons.....	2,225
Oil.....	Barrels.....	43
Coke.....	Tons.....	24
Gas.....	1,000 feet.....	1,070
Wood.....	Cords.....	218

Custom sawmills and gristmills.—Statistics for custom sawmills and gristmills are not included in the general tables or in the totals for manufacturing industries, but are presented in the following summary:

	Custom sawmills.	Custom gristmills.
Number of establishments.....	61	35
Persons engaged in industry.....	184	51
Proprietors and firm members.....	74	35
Salaried employees.....	1	
Wage earners (average number).....	100	16
Primary horsepower.....	3,340	1,906
Capital.....	\$147,198	\$61,076
Expenses.....	61,248	109,963
Services.....	41,901	3,227
Materials.....	1,865	1,105,181
Miscellaneous.....	7,392	1,555
Value of products.....	80,398	1,107,514

<sup>1</sup> Includes estimate of all grain ground. A similar estimate for value of lumber sawed by custom sawmills is impracticable.

MANUFACTURES—VERMONT.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.  
THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Cen- sus.	Num- ber of estab- lish- ments.	PERSONS ENGAGED IN INDUSTRY.				Pri- mary horse- power.	Capital.	Sala- ries.	Wages.	Cost of mate- rials.	Value of prod- ucts.	Value added by manu- fac- ture.
			Total.	Pro- pri- etors and firm mem- bers.	Sala- ried em- ploe- ees.	Wage earn- ers (aver- age num- ber).							
Expressed in thousands.													
<b>STATE—All industries.....</b>	1909 1904 1899	1,958 1,699 1,938	38,580 37,015	2,113 1,856	2,679 2,058 1,695	33,788 33,106 28,179	159,445 140,616 126,124	\$73,470 62,659 49,500	\$2,803 2,108 1,611	\$17,272 15,221 11,427	\$34,823 32,430 26,395	\$68,310 63,084 51,515	\$38,487 30,654 26,130
Agricultural implements.....	1909 1904 1899	11 10 17	401 278 254	5 8 19	36 23 24	360 247 211	1,194 666 972	950 491 484	36 31 18	185 114 80	272 182 104	582 442 370	310 260 206
Bread and other bakery products.....	1909 1904 1899	75 57 50	373 271 235	70 64 54	55 20 33	242 187 148	130 63	330 214 260	35 14 25	121 84 59	624 277 200	994 490 417	370 222 211
Brick and tile.....	1909 1904 1899	7 9 15	80 126 135	6 11 15	4 7 5	70 108 115	150 258 194	108 100 99	3 5 4	30 47 43	14 21 18	65 104 100	51 83 82
Butter, cheese, and condensed milk.....	1909 1904 1899	186 220 255	699 658 801	104 106 142	76 133 137	519 419 522	2,944 2,504 3,024	1,795 1,053 1,223	48 30 38	292 223 236	7,056 5,810 4,885	8,112 6,410 5,656	1,056 600 771
Canning and preserving.....	1909 1904 1899	8 7 8	142 69 8	11 4	13 8 7	118 57 128	240 124	319 98 110	14 5 6	46 17 28	214 63 108	330 123 207	116 60 99
Carriages and wagons and materials.....	1909 1904 1899	38 32 57	140 155 157	45 46	1 1 3	94 108 186	420 324	222 214 316	..... 1 1	50 59 91	58 55 98	168 104 285	100 169 187
Cars and general shop construction and repairs by steam-railroad companies.....	1909 1904 1899	7 6 7	1,023 862 811	..... ..... .....	31 29 32	992 833 779	905 1,010 404	558 621 711	32 21 24	546 450 446	529 377 350	1,135 890 825	606 483 475
Clothing, men's, including shirts.....	1909 1904 1899	11 11 27	1,369 1,315 568	4 2 8	74 45 32	1,281 1,268 526	323 432 158	890 852 425	83 46 44	404 337 145	591 507 360	1,274 1,205 720	683 609 369
Clothing, women's.....	1909 1904 1899	6 8 5	375 569 218	2 1 0	40 22 10	333 540 202	150 233 182	318 188 47	30 20 5	110 179 53	285 424 115	563 722 108	218 208 84
Confectionery.....	1909 1904 1899	10 4 5	206 157	11 4	50 25 38	145 128 103	112 110	245 179 203	34 18 20	45 40 33	214 136 110	350 246 248	142 110 138
Cooperage and wooden goods, not elsewhere specified.....	1909 1904 1899	25 23 13	687 523	25 31	27 21 2	635 471 131	2,203 1,587	600 427 91	22 19 1	203 168 40	240 150 50	663 445 160	453 295 104
Copper, tin, and sheet-iron products.....	1909 1904 1899	19 5 10	222 84	27 5	40 6 10	140 73 78	240 12	500 141 78	34 30 30	78 34 21	205 34 83	425 135 152	220 101 60
Flour-mill and gristmill products.....	1909 1904 1899	133 109 115	350 338	161 130	33 14 28	156 185 170	8,714 7,043	1,552 1,320 1,104	24 11 20	70 91 73	3,528 2,872 2,287	4,133 3,266 2,770	606 334 483
Foundry and machine-shop products.....	1909 1904 1899	56 66 67	2,141 2,087	48 62	233 207 166	1,890 1,818 1,429	4,510 2,870	4,059 3,385 2,680	295 227 148	1,085 943 672	1,335 933 862	3,755 3,370 2,372	2,429 2,456 1,519
Furniture and refrigerators.....	1909 1904 1899	10 23 24	1,226 1,106 1,072	8 14 24	99 70 61	1,110 1,112 987	2,707 3,208	1,987 1,400 1,040	118 81 61	498 424 358	703 798 555	1,618 1,533 1,253	915 825 698
Gas, illuminating and heating.....	1909 1904 1899	9 6 7	108 46 28	..... ..... .....	38 17 13	70 20 15	153 187	1,479 459 477	20 13 7	43 13 8	100 38 20	278 129 71	178 91 51
Hosiery and knit goods.....	1909 1904 1899	8 11 14	674 966 1,082	7 14 9	21 30 32	946 910 1,041	962 1,351 1,213	1,753 1,388 1,590	44 42 42	411 366 390	1,089 1,216 1,115	1,740 1,089 1,835	657 773 720
Leather goods.....	1909 1904 1899	3 3 3	20 31	4 3	2 3	14 25 21	..... ..... .....	13 24 11	1 2 10	6 9 27	12 16 55	28 39 55	14 23 28
Lime.....	1909 1904 1899	11 10	204 106	10 13	9 5	185 178	248 267	258 320	8 3	72 73	110 135	250 266	131 130
Lumber and timber products.....	1909 1904 1899	593 493 575	5,720 6,392	716 614	214 164 151	4,700 5,614 6,322	41,037 30,000	8,089 7,845 7,257	198 153 113	2,013 2,343 2,000	4,131 4,656 4,563	8,598 9,477 8,790	4,467 4,823 4,236
Marble and stone work.....	1909 1904 1899	342 220 251	11,545 8,339	510 358	624 354 211	10,411 8,007 4,608	29,107 14,832	17,243 14,467 5,357	616 413 202	6,404 4,455 2,650	2,518 2,010 1,881	12,365 9,570 6,380	9,877 7,599 4,466
Paper and wood pulp.....	1909 1904 1899	25 28 27	1,133 1,390 1,320	22 20 16	81 60 88	1,030 1,280 1,216	38,191 42,052 34,526	8,432 5,620 4,854	141 123 120	594 617 571	2,455 2,540 1,685	3,902 3,831 3,385	1,447 1,290 1,706

<sup>1</sup> Excluding statistics for one establishment, to avoid disclosure of individual operations.  
<sup>2</sup> Excluding statistics for two establishments, to avoid disclosure of individual operations.  
<sup>3</sup> Not reported separately.

MANUFACTURES—VERMONT.

TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.

THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY AND CITY.	Cen- sus.	Num- ber of estab- lish- ments.	PERSONS ENGAGED IN INDUSTRY.				Pri- mary horse- power.	Capital.	Sala- ries.	Wages.	Cost of mate- rials.	Value of prod- ucts.	Value added by manu- facture.
			Total.	Pro- pri- tors and firm mem- bers.	Sala- ried em- ploy- ees.	Wage earn- ers (aver- age num- ber).							
Expressed in thousands.													
<b>STATE—Continued.</b>													
Patent medicines and compounds and drug- gists' preparations.	1909	15	269	13	95	161	333	\$776	\$109	\$68	\$586	\$1,290	\$704
	1904	20	291	21	72	198	298	623	103	81	370	1,398	1,028
	1899	22	.....	.....	.....	98	279	758	160	110	690	2,124	1,434
Printing and publishing.....	1909	115	919	109	144	696	625	1,064	126	326	260	1,039	789
	1904	104	821	103	114	604	420	776	100	271	236	932	696
	1899	100	301	106	98	602	.....	687	65	240	190	792	602
Tobacco manufactures.....	1909	25	91	28	5	58	.....	65	5	34	43	118	75
	1904	23	106	26	3	77	.....	48	3	40	46	127	81
	1899	21	77	23	2	52	.....	43	2	20	31	86	55
Woolen, worsted, and felt goods, and wool hats.	1909	17	2,371	4	73	2,294	7,213	6,906	88	1,043	2,879	4,497	1,613
	1904	17	2,350	17	98	2,235	7,120	5,660	153	923	2,794	4,688	1,904
	1899	23	1,556	21	51	1,484	4,609	3,001	71	577	1,555	2,573	1,013
All other industries.....	1909	184	5,802	157	555	5,060	15,590	11,084	639	2,429	4,773	10,038	5,265
	1904	171	6,890	170	427	6,203	13,607	14,638	402	2,768	5,718	11,148	5,430
	1899	204	.....	.....	308	6,764	.....	10,588	300	2,461	4,371	9,673	5,302

CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES COMBINED.

Barre.....	1909	130	2,780	219	221	2,340	4,645	\$2,481	\$236	\$1,814	\$1,108	\$3,852	\$2,744
	1904	105	2,490	185	107	2,198	.....	1,090	137	1,515	909	3,373	2,464
	1899	140	.....	.....	47	1,875	.....	1,202	43	1,186	783	2,761	1,978
Burlington.....	1909	82	2,777	53	353	2,371	8,359	6,460	355	982	4,323	6,800	2,477
	1904	67	2,580	42	238	2,300	.....	5,124	279	836	3,804	6,356	2,552
	1899	78	.....	.....	214	2,232	.....	4,502	312	767	3,294	6,066	2,772
Rutland.....	1909	63	1,861	51	174	1,636	1,862	2,650	161	763	1,207	2,680	1,473
	1904	51	1,903	45	115	1,803	.....	2,180	111	857	1,162	2,523	1,361
	1899	61	.....	.....	122	1,466	.....	1,981	98	644	836	1,959	1,123

1 Excluding statistics for one establishment, to avoid disclosure of individual operations.  
 2 Excluding statistics for two establishments, to avoid disclosure of individual operations.

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Primary horse-power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners.					Total.	16 and over.		Under 16.		
					Male.	Female.	Average number.	Number.		Male.	Female.		Male.	Female.			
								Maximum month.	Minimum month.								
1 All industries .....	1,968	38,580	2,113	975	1,202	502	33,788	No 34,677	De 32,342	(1)	(1)	(1)	(1)	(1)	159,445		
2 Agricultural implements.....	11	401	5	14	15	7	300	Ap 393	Au 298	376	366	4	6	.....	1,494		
3 Artificial stone.....	3	15	4	.....	.....	.....	11	Je <sup>2</sup> 21	Ja <sup>3</sup> 0	21	21	.....	.....	.....	4		
4 Baskets, and rattan and willow ware...	6	72	9	.....	.....	.....	63	De 72	Mh <sup>2</sup> 59	72	68	4	.....	.....	335		
5 Boxes, fancy and paper.....	3	42	1	2	.....	2	37	Oc 48	Mh 17	46	14	31	1	.....	45		
6 Bread and other bakery products.....	75	373	70	11	21	23	242	Je 257	Ja 227	248	195	38	15	.....	136		
7 Brick and tile.....	7	80	6	4	.....	.....	70	Je 150	Ja 5	107	107	.....	.....	.....	160		
8 Butter, cheese, and condensed milk.....	180	699	104	42	15	19	519	Jy 620	Fe 428	518	494	22	2	.....	2,944		
9 Canning and preserving.....	8	142	11	8	2	3	118	Se 634	Mh 8	644	453	117	49	25	240		
10 Carriages and wagons and materials.....	38	140	45	.....	.....	1	94	Fe 98	Au 91	97	96	.....	1	.....	429		
11 Cars and general shop construction and repairs by steam-railroad companies.	7	1,023	.....	19	12	.....	992	Se 1,630	Jy 956	1,023	1,023	.....	.....	.....	965		
12 Cars and general shop construction and repairs by street-railroad companies.	3	16	.....	2	.....	.....	14	Ja <sup>4</sup> 14	De <sup>4</sup> 14	14	14	.....	.....	.....	9		
13 Clothing, men's, including shirts.....	11	1,350	4	24	33	17	1,281	De 1,423	Se 1,107	1,394	153	1,241	.....	.....	323		
14 Clothing, women's.....	6	375	2	9	25	6	333	De 407	Je 290	407	41	366	.....	.....	150		
15 Confectionery.....	10	206	11	9	31	10	145	No 183	Jy 114	181	75	100	.....	.....	112		
16 Cooperage and wooden goods, not elsewhere specified.	25	687	25	16	6	5	635	De 691	Jy 556	690	548	120	3	10	2,293		
17 Copper, tin, and sheet-iron products....	10	222	12	28	6	.....	149	De 227	My 96	229	223	6	.....	.....	240		
18 Cutlery and tools, not elsewhere specified	8	291	5	14	15	5	252	Au 265	Ja 232	251	230	11	10	.....	1,019		
19 Flour-mill and gristmill products.....	133	350	161	17	11	5	150	Mh 166	Se 145	182	182	.....	.....	.....	8,714		
20 Foundry and machine-shop products.....	56	2,141	48	78	121	34	1,890	De 2,122	My 1,691	2,095	2,034	60	1	.....	4,519		
21 Furniture and refrigerators.....	19	1,226	8	40	37	22	1,119	De 1,261	Jy 1,026	1,270	1,252	1	8	9	2,767		
22 Gas, illuminating and heating.....	9	108	.....	14	14	10	70	My 97	Mh 60	62	62	.....	.....	.....	153		
23 Hosiery and knit goods.....	8	974	7	10	7	4	940	No 1,000	Au 863	977	341	631	1	4	962		
24 Leather goods.....	3	20	4	2	.....	.....	14	Ja <sup>4</sup> 14	Jy <sup>4</sup> 14	14	14	.....	.....	.....	.....		
25 Lime.....	11	204	10	6	.....	2	185	My 212	Ja 156	168	167	.....	1	.....	298		
26 Lumber and timber products.....	593	5,720	716	127	53	34	4,700	De 5,460	Au 3,860	6,068	6,550	94	24	.....	41,937		
27 Marble and stone work.....	342	11,545	510	235	294	95	10,411	Au 11,180	De 7,372	10,239	10,222	1	15	1	29,107		
28 Musical instruments, pianos and organs, and materials.	4	654	.....	9	23	12	610	Ja 635	Au 577	580	563	17	.....	.....	1,966		
29 Paper and wood pulp.....	25	1,133	22	44	24	13	1,030	Mh 1,133	Au 885	1,113	1,035	78	.....	.....	38,191		
30 Patent medicines and compounds and druggists' preparations.	15	299	13	15	63	27	161	Fe 178	No 147	151	67	84	.....	.....	333		
31 Printing and publishing.....	115	619	109	45	55	44	606	De 609	Au 640	700	496	202	2	.....	625		
32 Pumps, not including steam pumps....	3	11	3	.....	.....	.....	8	Mh <sup>2</sup> 8	Ja <sup>2</sup> 7	8	8	.....	.....	.....	19		
33 Shipbuilding, including boat building..	7	20	8	.....	.....	1	11	Je 14	Ja <sup>2</sup> 9	10	10	.....	.....	.....	28		
34 Tobacco manufactures.....	25	91	28	2	3	.....	58	Ap 67	My 43	48	59	8	1	.....	7,213		
35 Woolen, worsted, and felt goods, and wool hats.	17	2,371	4	30	29	14	2,294	De 2,508	Au 2,143	2,507	1,528	943	9	27	.....		
36 All other industries <sup>6</sup> .....	147	4,081	127	115	274	81	4,084	.....	.....	.....	.....	.....	.....	.....	12,165		

<sup>1</sup> No figures given for reasons explained in the Introduction, page 2. See also discussion of wage earners on page 6.

<sup>2</sup> Same number reported for one or more other months.

<sup>3</sup> None reported for one or more other months.

<sup>4</sup> Same number reported for entire year.

<sup>6</sup> All other industries embrace—

Awnings, tents, and sails.....	2	Electroplating.....	1	Photographic apparatus and materials.....	1
Bags, other than paper.....	1	Fancy articles, not elsewhere specified.....	1	Scales and balances.....	2
Bicycles, motorcycles, and parts.....	1	Firearms and ammunition.....	1	Shoddy.....	2
Blacking and cleansing and polishing preparations	1	Flavoring extracts.....	1	Slaughtering and meat packing.....	2
Boots and shoes, including cut stock and findings.	4	Food preparations.....	5	Soap.....	2
Boxes, cigar.....	1	Fur goods.....	2	Sporting and athletic goods.....	2
Brass and bronze products.....	1	Furnishing goods, men's.....	4	Statuary and art goods.....	2
Brushes.....	1	Grease and tallow.....	1	Stoves and furnaces, including gas and oil stoves..	4
Carpets, rag.....	1	Hones and whetstones.....	1	Toys and games.....	1
Cash registers and calculating machines.....	1	Ice, manufactured.....	1	Upholstering materials.....	2
Charcoal.....	1	Instruments, professional and scientific.....	1	Vinegar and cider.....	24
Chemicals.....	1	Kaolin and ground earths.....	1	Wall plaster.....	2
Coffee and spice, roasting and grinding.....	1	Leather, tanned, curried, and finished.....	2	Window shades and fixtures.....	2
Coffins, burial cases, and undertakers' goods	2	Mineral and soda waters.....	13	Wirework, including wire rope and cable.....	1
Cotton goods, including cotton small wares	3	Models and patterns, not including paper patterns.	1	Wood distillation, not including turpentine and rosin.....	1
Dairymen's, poultrymen's, and apiarists' supplies	3	Needles, pins, and hooks and eyes.....	1	Wood, turned and carved.....	31
Electrical machinery, apparatus, and supplies.....	2	Paper goods, not elsewhere specified.....	2		

MANUFACTURES—VERMONT.

THE STATE, BY INDUSTRIES: 1909.

Capital.	EXPENSES.										Value of products.	Value added by manufacture.
	Total.	Services.			Materials.		Miscellaneous.					
		Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.		
1 \$79,470,107	\$59,850,800	\$1,495,849	\$1,307,580	\$17,271,702	\$1,468,187	\$33,354,541	\$166,426	\$342,058	\$591,481	\$3,852,376	\$68,309,824	\$33,487,096
2 949,520	528,988	21,591	14,435	185,459	19,957	251,678	.....	3,083	438	31,747	581,940	310,314
3 9,750	8,099	.....	.....	5,304	110	2,900	15	40	.....	330	10,815	7,805
4 45,187	43,544	.....	.....	29,046	605	11,423	.....	276	.....	2,194	54,708	42,080
5 21,400	30,300	2,300	784	7,596	1,261	25,475	1,435	44	.....	315	42,000	15,204
6 329,980	820,409	10,930	24,399	120,627	18,767	605,369	15,029	2,073	.....	23,215	994,236	370,100
7 107,821	50,143	3,398	.....	29,951	13,788	475	125	475	.....	1,931	64,744	50,481
8 1,794,772	7,620,463	30,461	17,230	292,040	65,777	6,090,637	8,249	8,133	24,700	183,740	8,112,230	1,051,425
9 318,759	301,615	8,650	5,570	46,453	3,911	210,406	1,350	510	.....	24,735	330,435	110,118
10 222,257	114,695	.....	312	50,067	3,654	54,007	621	1,408	742	3,344	158,200	101,479
11 558,370	1,134,545	23,787	7,853	546,304	26,783	502,179	.....	.....	.....	27,639	1,134,946	605,984
12 48,100	25,021	1,732	.....	9,444	971	12,833	.....	90	304	547	25,021	12,117
13 895,994	1,140,338	34,451	48,557	403,983	14,050	579,020	3,023	3,851	.....	55,494	1,274,480	683,501
14 317,891	446,399	12,131	17,528	169,556	3,994	281,252	395	408	.....	21,135	502,643	217,397
15 245,088	340,867	8,650	25,254	45,471	4,036	290,208	6,903	1,082	.....	39,003	350,206	142,362
16 600,126	605,124	17,220	4,833	263,306	2,850	230,720	1,646	2,728	21,407	61,414	692,631	453,361
17 560,489	338,868	8,619	25,842	78,231	3,426	201,867	884	900	1,578	17,431	425,242	210,940
18 415,866	352,228	20,632	19,778	128,207	5,085	161,055	96	2,546	.....	14,775	405,097	238,957
19 1,551,691	3,678,539	15,420	8,700	76,411	13,360	3,514,953	5,808	8,953	850	34,009	4,133,337	605,015
20 4,958,618	3,084,954	152,220	142,617	1,085,145	68,737	1,296,374	3,298	30,484	10,250	325,814	3,759,801	2,419,090
21 1,986,964	1,460,661	61,508	50,980	498,415	15,745	687,522	4,743	9,883	838	125,027	1,617,759	814,492
22 1,478,518	192,438	11,684	8,028	43,209	60,408	33,185	60	6,079	.....	20,785	278,138	178,545
23 1,752,780	1,653,483	31,536	12,780	410,770	17,597	1,071,451	15,038	1,686	.....	92,025	1,745,070	650,622
24 12,880	19,753	1,040	.....	5,710	74	12,396	175	82	.....	270	26,131	13,061
25 258,161	208,703	6,200	1,550	72,494	83,658	35,574	1,300	1,384	200	6,313	250,462	131,170
26 8,988,774	7,219,480	136,510	61,847	2,013,458	21,063	4,199,079	16,868	53,852	357,042	449,167	8,598,084	4,467,342
27 17,242,591	10,330,298	338,756	277,714	6,403,880	438,708	2,079,080	28,205	76,190	91,560	596,079	12,395,379	9,877,531
28 1,076,652	937,887	21,450	43,217	320,641	13,452	388,485	1,760	3,147	21,000	118,735	1,207,566	805,629
29 8,431,703	3,462,582	111,090	29,922	593,752	243,335	2,212,020	2,300	36,324	.....	233,830	3,901,634	1,446,270
30 775,915	1,080,910	43,444	65,259	67,508	6,589	579,250	1,404	5,009	.....	311,787	1,289,506	763,727
31 1,064,164	850,256	62,876	63,390	325,564	22,259	227,551	21,724	5,934	10,692	104,206	1,038,843	789,033
32 9,500	21,228	.....	.....	3,740	122	16,500	172	181	.....	513	30,850	14,228
33 40,884	9,093	.....	400	3,861	337	4,013	82	110	45	236	14,010	9,060
34 64,540	99,859	1,725	2,964	34,019	443	42,005	3,531	9,667	.....	4,545	117,550	74,148
35 6,900,319	4,326,842	59,817	28,199	1,042,769	145,331	2,733,670	.....	22,013	22,075	272,968	4,406,903	1,617,902
36 9,419,147	7,301,772	235,922	291,578	1,913,281	120,006	4,000,000	19,827	38,990	21,550	653,343	8,186,403	4,059,128